

**DEPARTMENT OF DEFENSE AUTHORIZATION FOR
APPROPRIATIONS FOR FISCAL YEAR 2007**

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES

UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

SECOND SESSION

ON

S. 2766

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2007 FOR MILITARY
ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CON-
STRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF
ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL
YEAR FOR THE ARMED FORCES, AND FOR OTHER PURPOSES

PART 7

STRATEGIC FORCES

MARCH 7, 29, APRIL 4, 6, 2006



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**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2007**

TUESDAY, MARCH 7, 2006

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

**NUCLEAR WEAPONS AND DEFENSE ENVIRONMENTAL
CLEANUP ACTIVITIES OF THE DEPARTMENT OF EN-
ERGY IN REVIEW OF THE DEFENSE AUTHORIZATION
REQUEST FOR FISCAL YEAR 2007 AND THE FUTURE
YEARS NUCLEAR SECURITY PROGRAM**

The subcommittee met, pursuant to notice, at 2:47 p.m. in room SR-232A, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions, Graham, and Bill Nelson.

Majority staff members present: Robert M. Soofer, professional staff member; Scott W. Stucky, general counsel; and Kristine L. Svinicki, professional staff member.

Minority staff member present: Madelyn R. Creedon, minority counsel.

Staff assistants present: Micah H. Harris and Jill L. Simodejka.

Committee members' assistants present: Meredith Beck and Matthew R. Rimkunas, assistants to Senator Graham; Stuart C. Mal-lory, assistant to Senator Thune; and William K. Sutey, assistant to Senator Bill Nelson.

**OPENING STATEMENT OF SENATOR JEFF SESSIONS,
CHAIRMAN**

Senator SESSIONS. The subcommittee will come to order. Senator Nelson has some conflicts in schedule and I know he is trying to get here, but I think it would be best for us to go ahead and get started and he can join us when he can. He is interested in being here. He is the ranking Democratic member of the committee.

The Subcommittee on Strategic Forces meets this afternoon to receive testimony on the President's request for fiscal year 2007 for the Department of Energy (DOE) activities under the jurisdiction of this subcommittee. I'm pleased to welcome our witnesses today, Linton F. Brooks, Administrator of National Nuclear Security Administration (NNSA) and Under Secretary of Energy. Mr. Brooks,

good to have you here, and James A. Rispoli, Assistant Secretary of Energy for Environmental Management (EM). We are glad to have you. I thank you for your service to our country and for taking the time and effort to join us today.

We will begin this hearing in open session. Should it become necessary to discuss any classified nuclear weapons or other security matters, this hearing will move to Russell Room 222 for a closed session at an appropriate time. The subcommittee will address as many matters as possible here in this open setting.

The Subcommittee on Strategic Forces has jurisdiction over approximately 60 percent of the entire DOE budget, which is remarkable, amounting to \$14.1 billion in the fiscal year 2007 budget request. Today we will receive testimony on the largest programs which comprise the DOE activities as they have been associated with the Department of Defense (DOD).

Specifically, we will examine the nuclear weapons activities of the NNSA and the Defense EM program. Within the context of the President's fiscal year 2007 budget request for these programs, we will examine the current state of health of these programs as well as some notable challenges and apparent impediments to success.

A critical task for this subcommittee is to exercise its oversight functions with respect to U.S. nuclear forces. Nuclear weapons are the most formidable weapons in our arsenal and under the Quadrennial Defense Review (QDR) just released, nuclear weapons continue to play the central role in our posture. We must be confident, therefore, that we are investing the taxpayers' dollars in a nuclear weapons program that will deliver the results expected.

Administrator Brooks, the subcommittee is interested in hearing your assessment of the Stockpile Stewardship Program (SSP) which is charged with maintaining the safety, security, and reliability and effectiveness of our current nuclear stockpile, as well as the progress towards development of the responsive infrastructure called for in the Nuclear Posture Review (NPR) of 2001.

The subcommittee is also interested in your views on the potential future transformation of the nuclear weapons stockpile, including the Reliable Replacement Warhead (RRW), as well as your reaction to the Secretary of Energy advisory board report titled "Recommendations for the Nuclear Weapons Complex of the Future."

Mr. Rispoli, the subcommittee is interested in your perspective as the Assistant Secretary of Energy for EM on the progress to date and the outlook when tackling their main challenges in addressing the environmental legacy of the Department's atomic energy program. You have only been there since last August, but probably been there just enough to know what the problems are. We would like to talk about those.

The environmental cleanup program is currently experiencing some spectacular failures, some of which I have discussed with the Secretary of Energy during his appearance before the full Armed Services Committee. We will explore these issues in greater detail today.

In your invitation to appear, you were also asked to address as a component of your testimony a number of policies and issues in the EM program which you were not able to address during your

confirmation last year, but which you had committed to address upon assuming duties as assistant secretary.

Senator Nelson, it's great to have you. Thank you for your commitment to our Nation's defense and your expertise that you bring to this subcommittee and to the full Armed Services Committee. You're a valued member. So this subcommittee looks forward to receiving that testimony as part of your written statement.

During his appearance before the full committee 3 weeks ago, I asked Secretary Bodman and expressed to him in plain terms my concerns about the efficiency with which DOE is carrying out its responsibilities as authorized by this committee. This country finds itself in a budget environment in which not a dollar can be wasted. Congress must have confidence that the funds are prudently expended and that programs are well managed.

I stated to the Secretary of Energy and I will say the same today that I am unconvinced that we are getting all we can for every dollar. While not accepting every aspect of my characterization of DOE programs, the Secretary in general agreed that DOE should do better, must do better. He stated that he considers it his job to find efficiencies and to fix them. However, it's not a job he can do alone.

I have pledged to the Secretary that through the execution of this subcommittee's oversight responsibilities, we are going to help him focus on those efforts and certainly you will be key persons in helping the Secretary achieve those goals. So these are some of the issues that we will explore in our hearing today and let me now recognize my distinguished ranking member, Senator Nelson of Florida, for any remarks he has.

STATEMENT OF SENATOR BILL NELSON

Senator BILL NELSON. Thank you, Mr. Chairman. Just to highlight a couple of issues. The first is the RRW. That program and its relationship to the overall SSP. This relatively new effort, if successful, should enable maintenance of a reliable nuclear deterrent without nuclear weapons testing and with a significantly smaller stockpile of nuclear weapons than we have currently.

But the RRW program is a challenging program and at the same time that the Department is getting the RRW program, you are also continuing to work on the life extension programs for the legacy nuclear warheads, particularly the W-76 and the W-80.

In addition, you are working on modernizing and hopefully consolidating some aspects of the nuclear weapons infrastructure. That's a significant task in itself. So I'm concerned, is there too much going on to get accomplished? Last week, the Secretary of the Air Force and the Chief of Staff of the Air Force talked about putting 6 pounds of work in a 5-pound bag.

Mr. Ambassador, I think you might be considering trying to put too much into the same pound bag. If the RRW is to achieve its goals, the DOD has to be a willing partner and look seriously at all of the requirements it has developed for you. Without the direct budgetary responsibility, perhaps DOD is asking too much and money is being spent on projects that we will eventually not need. DOD is stretched too far and without relief from some of what is probably not needed, the RRW may be then running out of money

for what it needs, or you don't have time if you're working on these other things to get the RRW. So we want to explore this.

Mr. Secretary, you're the manager of the largest construction project in the United States. At the moment, there are significant cost, schedule, and technological issues with this facility that is needed to treat millions of gallons of high-level radioactive waste stored in increasingly fragile underground storage tanks at the Hanford site. How we meet the commitments to Washington State and other States to complete the cleanup begun in the early 1990s is of serious concern to this committee.

I want you to discuss the plans for the EM program and tell us how to ensure that the cleanup is completed and that the health and safety of the work force and the community are protected. Thank you.

Senator SESSIONS. Thank you, Senator Nelson. You make some excellent points and I think there is a concern that's been recognized for sometime, as Senator Nelson said, that perhaps DOD incorrectly thinking it's really not their money, has asked for more out of DOE than is necessary.

I think that is perhaps true or has some truth to it. Likewise, I think that there is a possibility that another factor is at work, and it goes back to my days as United States attorney when I worked with probably 8 or 10 different Federal agencies and you learn how to work together or compete with one another. When they sign what they call memorandums of understanding (MOUs) which are very much like treaties between two sovereign powers, it really causes some difficulties.

I think there is also a danger that since DOE gets the money they get and any money that they save does not really go back to DOE programs, that they don't have the same incentive to cut costs and to manage efficiently as an agency, that they at least have an opportunity to save some money and use it for other things they give higher priority to.

So those are some of the things we'll be asking about here, about how this system is working. This is an awful lot of money that's involved and I think the taxpayers just want to give oversight to it. Mr. Ambassador, would you give us your thoughts.

STATEMENT OF AMBASSADOR LINTON F. BROOKS, UNDER SECRETARY FOR NUCLEAR SECURITY AND ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION, U.S. DEPARTMENT OF ENERGY

Ambassador BROOKS. Thank you, sir. I welcome the opportunity to discuss our budget request and I appreciate the committee's past strong support. I have submitted a statement for the record and I'd like to just summarize a few quick points.

Before I do that, I'd also like to note for the committee the presence of the new Deputy Administrator for Defense Programs, Tom D'Agostino. Mr. D'Agostino was confirmed by the Senate 2 weeks ago and sworn in last week, and I'm very grateful for the committee's very prompt action on him and I think you will enjoy working with him. He is an outstanding public servant.

The President's budget supports three main NNSA objectives, nuclear weapons stockpile, nuclear weapons nonproliferation, and

nuclear reactors. My written statement talks about nonproliferation and reactors. I'd like to speak about where we are in the weapons program.

First of all, it's very important for the committee to understand that the stockpile remains safe and reliable. We base this assessment on experiments, computation, analysis, laboratory tests of component warheads and systems, and the Secretary of Defense and the Secretary of Energy make an annual certification to this effect.

But as we draw down the stockpile, we have to consider the long-term implications of successive warhead refurbishments. Each refurbishment takes us a little further away from the configuration that we had when we tested, and that raises concerns not this month, not this year, probably not this decade, but it raises concerns sooner or later about our ability to ensure stockpile reliability and safety without testing.

So to manage that risk, we need to transform the stockpile and we need to transform the supporting infrastructure. Our concept for doing so depends, as Senator Nelson and, Mr. Chairman, you both mentioned, on the RRW. The idea here, as the committee understands, is to relax the Cold War design constraints, constraints that were perfectly sensible in the military situation of 20 years ago, but are not sensible for the military situation today. Those constraints maximize yield to weight ratios.

By relaxing them, we can design replacement components that are easier to manufacture, safer and more secure, eliminate environmentally dangerous materials which also saves money and increases design margins. This both ensures long-term reliability and reduces the chance that any future administration and any future Congress will be faced with the question of having to consider testing again.

We have two independent design teams from nuclear weapons laboratories exploring specific options. In addition to the benefit that we will get from the RRW, the design itself is important because it gives us the opportunity to train the next generation of weapons designers and engineers. Most of those who actually were involved in the design of nuclear weapons are nearing the end of their careers.

Both teams are confident in their design. Both teams are confident that they will meet requirements and their designs will be certifiable without nuclear testing. We'll get preliminary designs this month, and then there will be a fairly intense peer review process. In the fall, we'll select one of those two designs for further effort.

It is going to be important, however, if we are to get the benefits of the RRW that we pay great attention to the weapons complex. Now, it's important to understand the weapons complex of today is significantly different from the weapons complex that helped win the Cold War. We've seen dramatic reductions both in size and funding. In 1990 our weapons complex employed nearly 60,000 people. Today we have about half that number. The footprint of our facilities is reduced from 70 million square feet to 40 million square feet and we closed four facilities as shown in the chart which I be-

lieve you have copies of, including major Cold War facilities like the Rocky Flats plant in Colorado and Pinellas plant in Florida.

But the complex still isn't right and I think we have to implement what the President outlined in his NPR, a modern responsive infrastructure that can sustain the Nation's nuclear deterrent while being able to respond to DOD needs quickly and effectively. I think right now we can respond effectively but nobody would say that we can respond quickly.

We are carrying out an intensive effort to establish exactly what that complex should look like. Last summer, we received the report of the Secretary of Energy Advisory Board Task Force, sometimes called the Overskei Report. Our challenge is to gain the advantages that that report set forth in a way that's affordable.

Mr. Chairman, you mentioned the importance of being wise stewards of the taxpayers' money. The vision set forth in that report is a compelling vision. It's a very thoughtful job, but in the near term it's also an expensive process. What we are looking to do is gain the advantages of that vision without that expense and we will report to the committee in more detail on our thinking later this spring.

Let me mention a couple of other challenges that you and we are faced with in this budget. In the long term, the United States needs the ability to manufacture plutonium pits, the triggers for nuclear weapons. Last year, although supported by the authorizers, Congress declined to appropriate planning funds for a modern pit facility.

As a result, we are not seeking any funds in this year's budget. Instead, we are focusing on an interim capability at Los Alamos. We will work with Congress over the coming years as part of this overall infrastructure plan to identify an approach to the long-term pit requirements.

As Senator Nelson mentioned, we have DOD requirements for life extension programs. Last year, reductions in the life extension programs of the W-76 increased the risk of meeting the DOD schedules in 2007. A reduction in the W-80 cruise missile warhead will in fact delay deployment, and will increase costs and delay introduction. So this committee has always been a strong supporter of life extension programs which provide the most direct support of the DOD and I hope you will continue to be.

Last year, Congress significantly reduced funds for the facilities and infrastructure recapitalization program. That's a program to revitalize the fiscal infrastructure of the weapons complex and to basically get us out of the hole we got ourselves into in the '90s by underfunding maintenance.

We have agreed that we would terminate that program in 2011, but the program was reduced last year. I no longer believe that is possible to meet the 2011 deadline, and we will seek a 2-year extension. We are, however, committed to the idea that this is a temporary program to get us well after which it will be our responsibility to keep ourselves well.

Senator SESSIONS. This is an existing program?

Ambassador BROOKS. A program to work off the backlog in deferred maintenance. We inherited a fairly substantial backlog. Our

goal is to stabilize that backlog and then reduce it to within industry standards and then thereafter to maintain it.

We are, as the Chairman said, conscious of the need to be wise stewards of the public money. As a result of that, compared to the projections we gave this committee 2 years ago, we have reduced our weapons program by about \$860 million, about half of that for deficit reduction, the other half redirected primarily to non-proliferation.

Our request this year I believe to be balanced and responsible and if approved by Congress, it will let us continue transforming the stockpile structure, increase nonproliferation measures, and enhance Navy force projection. I hope the committee will support it. Thank you, sir, and I look forward to your questions.

[The prepared statement of Ambassador Brooks follows:]

PREPARED STATEMENT BY AMBASSADOR LINTON F. BROOKS

Thank you for the opportunity to discuss the President's fiscal year 2007 budget request for the National Nuclear Security Administration (NNSA). This is my fourth appearance before this committee as the Under Secretary for Nuclear Security, and I want to thank all of the Members for their strong support for our important national security responsibilities.

OVERVIEW

In the sixth year of this administration, with the strong support of Congress, NNSA has achieved a level of stability that is required for accomplishing our long-term missions. Our fundamental responsibilities for the United States include three national security missions:

- assure the safety and reliability of the U.S. nuclear weapons stockpile while at the same time transforming that stockpile and the infrastructure that supports it;
- reduce the threat posed by nuclear proliferation; and
- provide reliable and safe nuclear reactor propulsion systems for the U.S. Navy.

The budget request for \$9.3 billion, an increase of \$211 million, supports these NNSA missions.

Weapons Activities

The NNSA is committed to ensuring the long-term reliability, safety and security of the Nation's nuclear deterrent. Stockpile Stewardship is working; the stockpile remains safe and reliable. This assessment is based not on nuclear tests, but on cutting-edge scientific and engineering experiments and analysis, including extensive laboratory and flight tests of warhead components and subsystems. Each year, we are gaining a more complete understanding of the complex physical processes underlying the performance of our aging nuclear stockpile. However, as we continue to draw down the stockpile to the levels established in the Treaty of Moscow—between 1,700 and 2,200 deployed strategic nuclear weapons. We must consider the long-term implications of successive warhead refurbishments for the weapons remaining in the stockpile. Successive refurbishments will take us further from the tested configurations and it is becoming more difficult and costly to certify warhead remanufacture despite the extraordinary success of the Stockpile Stewardship Program (SSP).

If we were starting to build the stockpile from scratch today we would take a much different approach than we took during the Cold War. Most of today's warheads were designed to maximize explosive yield with minimum size and weight so that many warheads could be carried on a single delivery vehicle. As a result, weapons designers designed closer to the so-called "cliffs" in performance. If we were designing the stockpile today, we would manage risk differently, trading size and weight for increased performance margins and ease of manufacture and maintenance.

Second, the legacy stockpile was not designed for longevity. During the Cold War we introduced new weapons routinely, turning over most of the stockpile every 15–20 years. Today, our weapons are aging and now are being rebuilt in life extension programs that are both difficult and costly. Rebuilding nuclear weapons will never

be cheap, but Cold War decisions to use certain hazardous materials mean that, in today's health and safety culture, warheads are much more costly to remanufacture.

Furthermore, we continue to evolve our deterrent posture from its Cold War origins to one that requires far fewer weapons. Decisions the President announced in 2004 will result, by 2012, in the smallest total stockpile since the Eisenhower administration. Even with these unprecedented reductions, however, the stockpile—especially the components we keep in reserve—is probably too large.

Finally, with regard to physical security, we must consider new technology to ensure these weapons can never be used by those who wish to harm us. During the Cold War the main security threat to our nuclear forces was from espionage. Today, that threat remains, but to it has been added a post-September 11 threat of well-armed and competent terrorist suicide teams seeking to gain access to a warhead or to special nuclear materials in order to cause a nuclear detonation in place. This change has dramatically increased security costs. If we were designing the stockpile today, we would apply new technologies and approaches to warhead design as a means to reduce physical security costs.

Fortunately, we know how to address all of these problems.

The administration's Nuclear Posture Review (NPR), completed in December 2001, called for a transition from a threat-based nuclear deterrent with large numbers of deployed and Reserve weapons to a deterrent based on capabilities, with a smaller nuclear weapons stockpile and greater reliance on the capability and responsiveness of the Department of Defense (DOD) and NNSA infrastructure to respond to threats. Success in realizing this vision for transformation will enable us to achieve over the long term a smaller stockpile, one that is safer and more secure, one that offers a reduced likelihood that we will ever again need to conduct an underground nuclear test, and one that enables a much more responsive nuclear weapons infrastructure. Most importantly, this effort can go far to ensure a credible deterrent for the 21st century that will reduce the likelihood we will ever have to employ our nuclear capabilities in defense of the Nation—through demonstration of responsiveness in design and production, demonstration of confidence in our abilities, cleanup of portions of the Cold War legacy and demonstration of America's will to maintain nuclear preeminence. We have worked closely with the DOD to identify initial steps on the path to a responsive nuclear infrastructure.

What do we mean by “responsive nuclear weapons infrastructure?” By “responsive” we refer to the resilience of the nuclear enterprise to unanticipated events or emerging threats, and the ability to anticipate innovations by an adversary and to counter them before our deterrent is degraded. Unanticipated events could include complete failure of a deployed warhead type or the need to respond to new and emerging geopolitical threats. The elements of a responsive infrastructure include the people, the science and technology base, and the facilities and equipment to support a right-sized nuclear weapons enterprise. But more than that, it involves a transformation in engineering and production practices that will enable us to respond rapidly and flexibly to emerging needs. Specifically, a responsive infrastructure must provide capabilities, on appropriate timescales and in support of DOD requirements, to:

- Dismantle warheads;
- Ensure warheads are available to augment the operationally deployed force;
- Identify, understand, and fix stockpile problems;
- Design, develop, certify, and begin production of refurbished or replacement warheads;
- Maintain capability to design, develop, and begin production of new or adapted warheads, if required;
- Produce required quantities of warheads; and
- Sustain underground nuclear test readiness.

As we and the DOD take the first steps down this path, we clearly recognize that the “enabler” for transformation is our concept for the Reliable Replacement Warhead (RRW). The RRW would relax Cold War design constraints that maximized yield to weight ratios and thereby allow us to design replacement components that are easier to manufacture, are safer and more secure, eliminate environmentally dangerous materials, and increase design margins, thus ensuring long-term confidence in reliability and a correspondingly reduced chance we will ever need to resort to nuclear testing.

The combination of the RRW and a responsive infrastructure—each enabled by the other—may be genuinely transformational. The reduced stockpile the President approved in 2004 still retains a significant non-deployed nuclear stockpile as a hedge against technical problems or geopolitical changes. Once we demonstrate that

we can produce warheads on a timescale in which geopolitical threats could emerge, we would no longer need to retain extra warheads to hedge against unexpected geopolitical changes.

In addition to the mission of continuously maintaining the safety, security, reliability, and operational readiness of the Nation's nuclear deterrent, establishing the capabilities to achieve and sustain this transformation is a central focus of our activities. Transformation will, of course, take time. We are starting now with improving business and operating practices, both in the Federal workforce and across the nuclear weapons complex, and through restoring and modernizing key production capabilities. Full infrastructure changes, however, will take a couple of decades. I believe by 2030 we can achieve a responsive infrastructure that will provide capabilities, if required, to produce weapons with different or modified military capabilities. As important, through the RRW program we will revitalize our weapons design community to meet the challenge of being able to adapt an existing weapon within 18 months and design, develop, and begin production of a new design within 3–4 years of a decision to enter engineering development—goals that were established in 2004.

As part of the transformation process we are also actively reviewing the recommendations of the Secretary of Energy Advisory Board Nuclear Weapons Complex Infrastructure Task Force to prepare a comprehensive plan for transforming the nuclear weapons complex. Many of the recommendations are consistent with initiatives that NNSA was already considering or is implementing (design of a RRW, consolidation of Special Nuclear Materials, accelerating dismantlement of retired weapons, managing the evolving complex to enhance responsiveness and sustainability, and establishing an Office of Transformation). The analysis of this report and its recommendations is underway and should be completed and presented to Congress by this spring.

Transformation presents some significant near term challenges, one of which is pit production. The NNSA considers an appropriate pit production capacity to be essential to its long-term evolution to a more responsive nuclear weapons infrastructure. We are disappointed, therefore, that Congress declined to fund planning for a modern pit production facility in fiscal year 2006. As a result, we did not seek funding for this facility in fiscal year 2007; although we remain convinced that increased pit production capacity is essential to our long-term evolution to a more responsive nuclear weapons infrastructure. In coming months, we will work with Congress to identify an agreed approach to fund long-term pit production capacity. In the meantime, we plan to increase the Los Alamos National Laboratory (LANL) pit manufacturing capacity to 30–40 pits per year by the end of fiscal year 2012 in order to support the RRW. This production rate, however, will be insufficient to meet our assessed long-term pit production needs.

Another significant near term challenge is ensuring the security of our people, our nuclear weapons, our weapons-usable materials, our information, and our infrastructure from harm, theft or compromise. The job has become more difficult and costly as a result of two factors: the increased post-September 11 threat to nuclear warheads and associated fissile materials coupled with the primacy of “denying access” to these key assets—a much more rigorous security standard than “containment” of the asset. We will meet the requirements of the 2003 Design Basis Threat (DBT) by the end of this fiscal year. We expect to be compliant with the 2005 DBT revisions at the two most sensitive locations, the Secure Transportation Asset and the Pantex Weapons Plant by the end of fiscal year 2008 as required by Departmental policy.

The world in 2030 will not be more predictable than it is today, but this vision of our future nuclear weapons posture is enabled by what we have learned from 10 years of experience with science-based Stockpile Stewardship, from planning for and carrying out life extension programs for our legacy stockpile, and from coming to grips with national security needs of the 21st century as laid out in the NPR. A world of a successful responsive infrastructure isn't the only plausible future of course. But it is one we should strive for. It offers the best hope of achieving the President's vision of the smallest stockpile consistent with our Nation's security. That's why we are embracing this vision of stockpile and infrastructure transformation. We should not underestimate the challenge of transforming the enterprise, but it is clearly the right path for us to take.

Defense Nuclear Nonproliferation

Let me now turn to our nuclear nonproliferation and threat reduction programs. Acquisition of nuclear weapons, weapons of mass destruction (WMD) capabilities, technologies, and expertise by rogue states or terrorists poses a grave threat to the United States and international security. The pursuit of nuclear weapons by terror-

ists and states of concern makes it clear that our threat detection programs are urgently required, must be successful, and must proceed on an accelerated basis. The NNSA budget request addresses this urgency and demonstrates the President's commitment to prevent, contain, and roll back the proliferation of nuclear weapons-usable materials, technology, and expertise.

Our programs are structured around a comprehensive and multi-layered approach to threat reduction and nuclear nonproliferation. We work with more than 70 countries to secure dangerous nuclear and radioactive materials, halt the production of fissile material, detect the illegal trafficking or diversion of nuclear material, and ultimately dispose of surplus weapons-usable materials. We also work with multilateral institutions including the International Atomic Energy Agency (IAEA) and the Nuclear Suppliers Group to strengthen nuclear safeguards and improve the nuclear export control regulatory infrastructure in other countries. This multi-layered approach is intended to identify and address potential vulnerabilities within the international nonproliferation regime, reduce the incentive for terrorists and rogue states to obtain WMD, and limit terrorists' access to deadly weapons and materials.

A significant amount of our work falls at the intersection of nonproliferation and peaceful use of nuclear materials. The United States is setting an example by making a firm commitment to reducing its nuclear arsenal and recycling substantial quantities of weapons-usable highly enriched uranium for peaceful, civilian, energy-generating purposes. In 1994, the United States declared 174 tons of highly enriched uranium (HEU) to be in excess of our national security needs. The great bulk of that material is now in the process of being downblended for use in civilian nuclear power reactors. Last year, we announced that 17.4 metric tons (MT) of this material will be downblended and set aside to establish a fuel bank in support of our efforts to develop an international reliable fuel supply mechanism, an issue I will return to later in my statement.

In addition, in May 2004, President Bush announced plans to reduce our Nation's nuclear weapons stockpile by nearly half, to its smallest size since the Eisenhower administration. This decision enables us to begin to dispose of a significant amount of weapons-grade nuclear material. Last year, the administration committed to remove an additional 200 MT of HEU—enough material for approximately 8,000 nuclear warheads—from any further use as fissile material in U.S. nuclear weapons. This represents the largest amount of special nuclear material ever removed from the stockpile in the history of the U.S. nuclear weapons program. The bulk of this material will be retained for use in propulsion systems for our Nation's nuclear Navy—a step that will allow us to postpone the need to construct a new uranium high-enrichment facility for at least 50 years. Twenty MT of this HEU will be downblended to LEU for use in civilian nuclear power reactors or research reactors.

We are also working with the Russian Federation to eliminate 34 MT of weapons-usable plutonium in each country that will be converted into mixed oxide (MOX) fuel and burned in nuclear power reactors. We believe we have now resolved the impasse over liability that has long delayed the plutonium disposition program and the construction of the MOX plant at our Savannah River Site.

Much of our work focuses on emerging issues such as detecting clandestine nuclear supply networks, monitoring efforts by more countries to acquire nuclear weapons, and preventing the spread of nuclear fuel cycle technology. We have taken a number of steps to shut down illicit supply networks and keep nuclear materials out of the hands of terrorists as reflected in U.S. leadership in support of the Proliferation Security Initiative, Security Council Resolution 1540, criminalizing proliferation, and in strengthening international export control regimes.

We have worked to expand our programs designed to stop nuclear smuggling and nuclear terrorism by cooperatively developing and employing radiological and nuclear detection equipment at key border crossings, airports, and major seaports, or "megaports," worldwide. NNSA also assists and trains customs officials at home and abroad to detect the illicit trafficking of nuclear and radiological materials, as well as dual-use commodities that might be useful in weapons of mass destruction programs. We are also expanding our efforts to secure and transform global inventories of weapons-usable materials. Our programs include the Global Threat Reduction Initiative (GTRI) to reduce and secure fissile and radioactive material worldwide; our International Material Protection and Cooperation (MPC&A) program which has accelerated efforts to improve the security of weapons usable material in Russia and elsewhere; and our efforts to complete the conversion of research reactors throughout the world to the use of low enriched uranium within the next decade. There are also two complementary programs that address the repatriation of fresh and spent HEU material from Russian-supplied research reactors and U.S.-origin material from research reactors around the world.

Cooperation with Russia on nonproliferation is nothing new for the United States, but this cooperation has been heightened following the rise of global terrorism and the events of September 11, 2001. The Joint Statement on Nuclear Security Cooperation issued by Presidents Bush and Putin at their Bratislava meeting last year is but one example of the significant progress we have made over the last 5 years. This joint statement has helped expedite our cooperative work with Russia. For example, as a result of the Bush-Putin Bratislava joint statement, we were able to make the return of fresh and spent HEU fuel from U.S. and Russian-design research reactors in third countries a top priority, as well as a plan for joint work to develop low-enriched uranium fuel for use in these reactors. As a result, we were able to complete the conversion of a Russian-supplied research reactor located in the Czech Republic to low-enriched fuel and to airlift a significant amount of HEU from the Czech Technical University reactor located near Prague for safe and secure storage in Russia. We have also made significant progress on the other Bratislava joint statement items, and we expect this cooperation and success will continue.

Beyond the threat of nuclear terrorism, illicit networks engaging in nuclear trade, and additional states seeking nuclear weapons capability, the nonproliferation community also faces another significant challenge—revitalizing nuclear energy throughout the globe in a manner that also advances our nonproliferation interests. We have the opportunity to reshape our collective approach to ensure that nonproliferation is the cornerstone of the next evolution of civilian nuclear power and fuel cycle technology. The challenge before us is to make sure we design—from the very beginning—technologies and political arrangements that limit the spread of sensitive fuel cycle capabilities and ensure that rogue states do not use civilian nuclear power as cover for a covert nuclear weapons program.

Last month, the administration announced the Global Nuclear Energy Partnership (GNEP) as part of President Bush's Advanced Energy Initiative. GNEP is a comprehensive strategy to enable an expansion of nuclear power in the U.S. and around the world, to promote nuclear nonproliferation goals; and to help resolve nuclear waste disposal issues. Fundamental to GNEP is a new approach to fuel cycle technology. Under this proposed new approach, countries with secure, advanced nuclear fuel cycle capabilities would offer commercially competitive and reliable access to nuclear fuel services—fresh fuel and recovery of used fuel—to other countries in exchange for their commitment to forgo the development of enrichment and recycling technology.

Over the next year, we will work with other elements of the Department to establish GNEP, paying special attention to developing advanced safeguards and developing the parameters for international cooperation. Since the signing of the Nuclear Non-Proliferation Treaty, the world has sought to prevent the proliferation of nuclear weapons while expanding the benefits of nuclear technology. I believe that GNEP takes us closer to that goal. By allowing us to move beyond abstract discussions to tangible actions that will benefit directly those who join us in this partnership, GNEP will offer us the opportunity to take the international lead in making nonproliferation an integral part of our global nuclear safety and security culture.

Naval Reactors

Also contributing to the Department's national security mission is the Department's Naval Reactors Program, whose mission is to provide the U.S. Navy with safe, militarily-effective nuclear propulsion plants and ensure their continued safe, reliable and long-lived operation. Nuclear propulsion enhances our warship capabilities by providing the ability to sprint where needed and arrive on station; ready to conduct sustained combat operations when America's interests are threatened. Nuclear propulsion plays a vital role in ensuring the Navy's forward presence and its ability to project power anywhere in the world.

The Naval Reactors Program has a broad mandate, maintaining responsibility for nuclear propulsion from cradle to grave. Over 40 percent of the Navy's major combatants are nuclear-powered, including aircraft carriers, attack submarines, and strategic submarines, which provide the Nation's most survivable deterrent.

FISCAL YEAR 2007 BUDGET REQUEST BY PROGRAM

The President's fiscal year 2007 budget request totals \$9.3 billion, an increase of \$211 million or 2.3 percent. We are managing our program activities within a disciplined 5-year budget and planning envelope. We are doing it successfully enough to be able to address the administration's high priority initiatives to reduce global nuclear danger in Defense Nuclear Nonproliferation, and provide for needed funding increases in some of our programs within an overall modest growth rate.

Weapons Activities

The fiscal year 2007 budget request for the programs funded within the Weapons Activities appropriation is \$6.41 billion, less than a 1-percent increase over fiscal year 2006. This request supports the requirements of the Stockpile Stewardship Program consistent with the administration's Nuclear Posture Review (NPR) and the revised stockpile plan submitted to Congress in June 2004. Our request places a high priority on accomplishing the near-term workload and supporting technologies for the stockpile along with the long-term science and technology investments to ensure the design and production capability and capacity to support ongoing missions. This request also supports the facilities and infrastructure that must be responsive to new or emerging threats.

Directed Stockpile Work (DSW) is an area of special emphasis this year with a fiscal year 2007 request of \$1.41 billion, a 3-percent increase over fiscal year 2006. In fiscal year 2007, we will be accelerating efforts for dismantlement of retired warheads and consolidation of special nuclear materials across the nuclear weapons complex. Both of these efforts will contribute to increasing the overall security at NNSA sites. DSW also supports routine maintenance and repair of the stockpile; refurbishes warheads through the Life Extension Programs; and, maintains the capability to design, manufacture, and certify new warheads, for the foreseeable future. DSW also supports managing the strategy, driving the change, and performing the crosscutting initiatives required to achieve responsiveness objectives envisioned in the NPR. Our focus remains on the stockpile, to ensure that the nuclear warheads and bombs in the U.S. nuclear weapons stockpile are safe, secure, and reliable.

Progress in other parts of the Stockpile Stewardship Program (SSP) continues. The fiscal year 2007 request for the six Campaigns is \$1.94 billion, a 9 percent decrease from fiscal year 2006. The Campaigns focus on scientific and technical efforts and capabilities essential for assessment, certification, maintenance, and life extension of the stockpile and have allowed NNSA to move to "science-based" stewardship. These campaigns are evidence of NNSA excellence and innovation in science, engineering and computing that, though focused on the nuclear weapons mission, have much broader application.

Specifically, \$425 million for the Science and Engineering Campaigns provides the basic scientific understanding and the technologies required to support the workload and the completion of new scientific and experimental facilities. We will continue to maintain the ability to conduct underground nuclear tests at the Nevada Test Site if required, but let me be clear, nothing at this time indicates the need for resumption of underground testing for the foreseeable future.

The Readiness Campaign, with a request of \$206 million, develops and delivers design-to-manufacture capabilities to meet the evolving and urgent needs of the stockpile and supports the transformation of the nuclear weapons complex into an agile and more responsive enterprise.

The request of \$618 million for the Advanced Simulation and Computing Campaign supports the schedule to enhance the computational tools and technologies necessary to support the continued assessment and certification of the refurbished weapons, aging weapons components, and a RRW program without underground nuclear tests. As we enhance these tools to link the historical test base of more than 1,000 nuclear tests to computer simulations, we can continue to assess whether the stockpile is safe, secure, reliable, and performs as required.

The \$451 million request for the Inertial Confinement Fusion Ignition and High Yield Campaign is focused on the execution of the first ignition experiment at the National Ignition Facility (NIF) in 2010 and provides facilities and capabilities for high-energy-density physics experiments in support of the SSP. To achieve the ignition milestone, \$255 million will support construction of NIF and the NIF Demonstration Program and \$168 million will support the National Ignition Campaign. The ability of NIF to assess the thermonuclear burn regime in nuclear weapons via ignition experiments is of particular importance. NIF will be the only facility capable of probing in the laboratory the extreme conditions of density and temperature found in exploding nuclear weapons.

The Pit Manufacturing and Certification Campaign request of \$238 million continues work to manufacture and certify the W88 pit in 2007 and to address issues associated with manufacturing future pit types including the RRW and increasing pit production capacity at Los Alamos National Laboratory.

Readiness in Technical Base and Facilities (RTBF) and Facilities and Infrastructure Recapitalization Program (FIRP)

In fiscal year 2007 we are requesting \$1.98 billion for the maintenance and operation of existing facilities, remediation and disposition of excess facilities, and con-

struction of new facilities. This is of critical importance to enable NNSA to move toward a more supportable and responsive infrastructure.

Of this amount, \$1.69 billion is requested for Readiness in Technical Base and Facilities (RTBF), an increase of 3 percent from fiscal year 2006, with \$1.4 billion in Operations and Maintenance and \$281 million for RTBF Construction. RTBF operates and maintains current facilities, and ensures the long-term vitality of the NNSA complex through a multi-year program of infrastructure construction.

This request also includes \$291 million for the Facilities and Infrastructure Recapitalization Program (FIRP), a separate and distinct program that is complementary to the ongoing RTBF efforts. The FIRP mission is to restore, rebuild and revitalize the physical infrastructure of the nuclear weapons complex. FIRP works in partnership with RTBF to assure that facilities and infrastructure are restored to an appropriate condition to support the mission, and to institutionalize responsible and accountable facility management practices. FIRP activities include reducing deferred maintenance, recapitalizing the infrastructure, and reducing the maintenance base by eliminating excess real property. The FIRP recapitalization projects are key to restoring the facilities that house the people, equipment, and material necessary to the SSP, the primary NNSA mission. FIRP Facility Disposition activities reduce Environment, Safety and Health (ES&H) and safeguards and security liabilities, address footprint reduction of the complex, and reduce long-term costs and risks. The primary objective of FIRP Infrastructure Planning is to ensure that projects are adequately planned in advance of project start.

Last year, Congress significantly reduced funds for the FIRP program. This reduction, coming on reductions in planned levels dictated by fiscal constraints, means that the original (and Congressionally mandated) goal of eliminating the maintenance backlog and terminating the FIRP program by 2011 is no longer attainable. This matter may require legislation extending the FIRP program to 2013. We remain committed to the concept of FIRP as a temporary, "get well" program and to the long-term, sustained funding of maintenance within the RTBF program.

Secure Transportation Asset

In fiscal year 2007, the budget requests \$209 million for Secure Transportation Asset (STA), a minor decrease from fiscal year 2006 levels, for meeting the Department's transportation requirements for nuclear weapons, components, and special nuclear materials shipments. The workload requirements for this program will escalate significantly in the future to support the dismantlement and maintenance schedule for the nuclear weapons stockpile and the Secretarial initiative to consolidate the storage of nuclear material. The challenge to increase secure transport capacity is coupled with and impacted by increasingly complex national security concerns. To support the escalating workload while maintaining the safety and security of shipments, STA is increasing the cumulative number of Safeguard Transporters in operation by 3 per year, with a target total of 51 in fiscal year 2011.

Environmental Projects and Operations

We are requesting \$17.2 million for Environmental Projects and Operations. The \$17.2 million request is for a new function, Long Term Response Actions/Long-Term Stewardship, which covers continuing environmental stewardship at NNSA sites after the completion of Environmental Management (EM) activities. This new program at each site begins when EM cleanup activities are completed, and will continue for several years. Activities comprise routine inspections of landfill covers/caps, and maintenance of pump and treatment systems, and starting in fiscal year 2007, will be performed at three NNSA sites: Lawrence Livermore National Laboratory, Kansas City Plant, and Sandia National Laboratories.

The fiscal year 2007–2011 budget request does not include the transfer of legacy environmental management activities at NNSA sites that was proposed in the fiscal year 2006 budget request. However, the responsibility for newly generated waste at the Lawrence Livermore National Laboratory and the Y-12 National Security Complex was transferred to the NNSA in fiscal year 2006, and is managed in the Readiness in Technical Base and Facilities GPRA unit.

Nuclear Weapons Incident Response

The fiscal year 2007 request for Nuclear Weapons Incident Response is \$135 million, an increase of 15 percent over fiscal year 2006. The NNSA Emergency Operations remains the U.S. government's primary capability for radiological and nuclear emergency response in support of homeland security. The program is continuing efforts to enhance emergency response capabilities, and the budget request supports all assets as planned, with emphasis on recruitment and training of personnel called into action during emergency situations. The fiscal year 2007 increase is primarily associated with the research and development efforts of the Render Safe

Research and Development program. This budget realigns this research and development funding to emergency response where the program is managed.

Safeguards and Security

The fiscal year 2007 request for Safeguards and Security is \$754 million. This budget supports two security-related activities. The budget request proposes that the physical security portion of NNSA's Safeguards and Security GPRA Unit be renamed "Defense Nuclear Security", consistent with the responsible NNSA organization. This program is responding to a revision in threat guidance affecting physical security at all NNSA sites. Meeting the Design Basis Threat will require further upgrades to equipment, personnel and facilities, and NNSA is committed to completing these activities. The Cyber Security program activities, managed by the NNSA Chief Information Officer, comprise the rest of this account, and the fiscal year 2007 request is essentially level with the fiscal year 2006 funding level. The Request includes funding for the DOE Diskless Conversion initiative. Meeting the post-September 11 security requirements has required a significant long-term investment, reflecting DOE's continuing commitment to meet these requirements.

Defense Nuclear Nonproliferation

The Defense Nuclear Nonproliferation program goal is to detect, prevent, and reverse the proliferation of WMDs while mitigating nuclear risk worldwide. Our programs address the danger that hostile nations or terrorist groups may acquire weapons of mass destruction or weapons-usable material, dual-use production or technology, or WMD capabilities. Our primary focus in this regard is securing or disposing of vulnerable stockpiles of weapon-usable materials, technology, and expertise in Russia and other countries of concern. The administration's request of \$1.73 billion to support NNSA activities to reduce the global weapons of mass destruction proliferation threat represents almost a 7-percent increase over the budget for comparable fiscal year 2006 activities.

The administration's fiscal year 2007 Fissile Material Disposition budget request is \$638 million, an increase of \$169 million over fiscal year 2006. This increase reflects the progress in implementing the plutonium disposition program in the past year. Of this amount, \$551 million will be allocated toward disposing of surplus U.S. and Russian plutonium and \$87 million will be allocated toward the disposition of surplus U.S. highly enriched uranium. The plutonium disposition program, the Department's largest nonproliferation program, plans to dispose of 68 MT of surplus Russian and U.S. weapons-grade plutonium by fabricating it into MOX fuel for use in civilian nuclear power-generating reactors. The United States and Russia successfully completed negotiations of a liability protocol for the program, and senior Russian government officials have assured the United States that this protocol will be signed in the near future. DOE has also been working to validate the U.S. MOX project cost and schedule baseline as part of our project management process, and we will have a validated baseline in place before construction begins. DOE received authorization to begin construction of the MOX facility from the Nuclear Regulatory Commission, began site preparation work for the MOX facility at the Savannah River Site, and implemented a number of improvements to strengthen the management of the MOX project. Current plans call for construction of the U.S. MOX facility to start in 2006, with operations to start in 2015. The administration's budget request is essential for continuing this work in fiscal year 2007, which will be a peak construction year. Now that the liability issue is nearing resolution, high-level U.S.-Russian discussions are taking place to confirm the technical and financial details for the Russian construction program.

The administration's fiscal year 2007 budget request of \$107 million for the GTRI is a 10-percent increase over fiscal year 2006 and supports the urgency carried in ambitious completion dates and objectives set by the program. GTRI represents the Department's latest effort to identify, secure, recover, and/or facilitate the disposition of the vulnerable nuclear and radioactive materials worldwide that pose a threat to the United States and the international community. Since the creation of GTRI, we have enjoyed a number of successes. Under our radiological threat reduction program, we have completed security upgrades at more than 340 facilities around the world. As a result of the Bush-Putin Bratislava joint statement on enhanced nuclear security cooperation, we have established a prioritized schedule for the repatriation of U.S.-origin and Russian-origin research reactor nuclear fuel located in third countries. As part of our nuclear materials threat reduction efforts under GTRI, three successful shipments in fiscal year 2005 to repatriate Russian-origin fresh HEU from the Czech Republic (two shipments) and Latvia.

In accordance with the President's Bratislava commitment, we have also begun working with the Russian Federation to repatriate Russian-origin spent fuel. We

have also conducted several successful shipments to repatriate U.S.-origin spent nuclear fuel from Japan, the Netherlands, Sweden, Greece, and Austria. We have converted three research reactors in the Netherlands, Libya, and the Czech Republic from the use of HEU to the use of low-enriched uranium (LEU) fuel so far in 2006, and we have completed physical security upgrades at three priority sites housing dangerous materials in Ukraine, Kazakhstan, and Uzbekistan.

The International Material Protection and Cooperation fiscal year 2007 budget request of \$413 million is a 2 percent decrease from fiscal year 2006. For more than a decade, the United States has worked cooperatively with the Russian Federation and other former Soviet republics to secure nuclear weapons and weapons material that may be at risk of theft or diversion. As part of the Bush-Putin Bratislava joint statement, we agreed to accelerate security upgrades at Russian sites holding weapons-usable materials and warheads. The Bratislava joint statement also provided for a comprehensive joint action plan for cooperation on security upgrades of Russian nuclear facilities at Rosatom and Ministry of Defense sites. In addition, this statement called for enhanced cooperation in the areas of nuclear regulatory development, sustainability, secure transportation, MPC&A expertise training, and protective force equipment. A number of major milestones for this cooperative program are on the horizon, and the fiscal year 2007 budget ensures that sufficient funding will be available to meet these milestones. Security upgrades for Russian Rosatom facilities will be completed by the end of 2008—2 years ahead of schedule. By the end of 2008 we will also complete cooperative upgrades at the nuclear warhead storage sites of the Russian Strategic Rocket Forces and the Russian Ministry of Defense sites. By the end of fiscal year 2007, we will have provided security upgrades at more than 80 percent of all the nuclear sites in Russia at which we now plan cooperative work.

The administration's budget request will enable us to expand and accelerate the deployment of radiation detection systems at key transit points within Russia and accelerate installation of such equipment in five other priority countries to prevent attempts to smuggle nuclear or radiological materials across land borders. Through our Megaports initiative, we plan to deploy radiation detection capabilities at three additional major seaports in fiscal year 2007 to pre-screen cargo containers destined for the United States for nuclear and radiological materials, thereby increasing the number of completed ports to 13.

The fiscal year 2007 budget request of \$207 million for the Elimination of Weapons Grade Plutonium Production (EWGPP) is an increase of 18 percent from fiscal year 2006. The EWGPP program is working toward completing the permanent shut down of the three remaining weapons grade plutonium production reactors in Russia at Seversk and Zheleznogorsk. Every week, these reactors currently produce enough fissile material for several nuclear weapons. The overall EWGPP plan is to shutdown these reactors permanently and replace the heat and electricity these reactors supply to local communities with energy generated by fossil fuel plants by December 2008 in Seversk and December 2010 in Zheleznogorsk. The reactors will shut down immediately when the fossil plants are completed. The first validated estimate of total program cost—\$1.2 billion—was determined in January 2004. After extensive negotiations with Russia, we achieved \$200 million in cost savings. Also, under the authority to accept international funding as provided in the Ronald W. Reagan Defense Authorization Act for Fiscal Year 2005, we have received pledges of \$30 million from six Global Partnership participants. Construction of the fossil fuel plant at Seversk started in late 2004, and the start of construction of the fossil fuel plant at Zheleznogorsk was recently approved. The increased funding as part of the fiscal year 2007 budget request allows for both construction projects to remain on schedule and thereby hold the line on cost.

The fiscal year 2007 budget requests \$269 million for Nonproliferation and Verification Research and Development. This effort includes a number of programs that make unique contributions to national security by researching the technological advancements necessary to detect and prevent the illicit diversion of nuclear materials. The Proliferation Detection program advances basic and applied technologies for the nonproliferation community with dual-use benefit to national counterproliferation and counterterrorism missions. Specifically, this program develops the tools, technologies, techniques, and expertise for the identification, location, and analysis of the facilities, materials, and processes of undeclared and proliferant WMD programs. The Proliferation Detection program conducts fundamental research in fields such as radiation detection, providing support to the Department of Homeland Security (DHS) and the Intelligence Community. The Nuclear Explosion Monitoring program builds the Nation's operational sensors that monitor from space the entire planet to detect and report surface, atmospheric, or space nuclear detonations. This program also produces and updates the regional geophysical

datasets enabling operation of the Nation's ground-based seismic monitoring networks to detect and report underground detonations.

The fiscal year 2007 budget request for Nonproliferation and International Security is \$127 million. This figure cannot be directly compared to fiscal year 2006 because of a budget structure change that has realigned the Global Initiatives for Proliferation Prevention and HEU Transparency programs to this GPRA unit. Through this program the Department provides technical and policy expertise in support of U.S. efforts to strengthen international nonproliferation institutions and arrangements, fosters implementation of nonproliferation requirements through engagement with foreign partners, and helps develop the mechanisms necessary for transparent and verifiable nuclear reductions worldwide. This budget request addresses our need to tackle key policy challenges including efforts to strengthen the IAEA safeguards system, attempts to block and reverse proliferation in Iran and North Korea, attention to augmenting U.S. cooperation with China, India, and Russia, and our plan to build-up the nonproliferation component of the Global Nuclear Energy Partnership.

Naval Reactors

The Naval Reactors fiscal year 2007 budget request of \$795 million is an increase of \$13.5 million from fiscal year 2006. The program's development work ensures that nuclear propulsion technology provides options for maintaining and upgrading current capabilities, as well as for meeting future threats to U.S. security.

The majority of funding supports the program's number-one priority of ensuring the safety and reliability of the 104 operating naval nuclear propulsion plants. This work involves continual testing, analysis, and monitoring of plant and core performance, which becomes more critical as the reactor plants age. The nature of this business demands a careful, measured approach to developing and verifying nuclear technology; designing needed components, systems, and processes; and implementing them in existing and future plant designs. Most of this work is accomplished at Naval Reactors' DOE laboratories. These laboratories have made significant advancements in extending core lifetime, developing robust materials and components, and creating an array of predictive capabilities.

Long-term program goals have been to increase core energy, to achieve life-of-the-ship cores, and to eliminate the need to refuel nuclear powered ships. Efforts associated with this objective have resulted in planned core lives that are sufficient for the 30-plus year submarine (based on past usage rates) and an extended core life planned for CVN 21 (the next generation aircraft carrier). The need for nuclear propulsion will only increase over time as the uncertainty of conventional fuel cost and availability grows.

Naval Reactors' Operations and Maintenance budget request is categorized into six areas: Reactor Technology and Analysis; Plant Technology; Materials Development and Verification; Evaluation and Servicing; Advanced Test Reactor (ATR) Operations and Test Support; and Facility Operations.

The \$212 million requested for Reactor Technology and Analysis will support continued work on the design for the new reactor plant for the next generation of aircraft carriers, CVN-21. These efforts also support the design of the Transformational Technology Core (TTC), a new high-energy core that is a direct outgrowth of the Program's advanced reactor technology and materials development and verification work.

Reactor Technology and Analysis also develops and improves the analysis tools, which can be used to safely extend service life beyond our previous experience base. The increasing average age of our Navy's existing reactor plants, along with future extended service lives, a higher pace of operation and reduced maintenance periods, place a greater emphasis on our work in thermal-hydraulics, structural mechanics, fluid mechanics, and vibration analysis. These factors, along with longer-life cores, mean that for years to come, these reactors will be operating beyond our previously proven experience base.

The \$131 million requested for Plant Technology provides funding to develop, test, and analyze components and systems that transfer, convert, control, and measure reactor power in a ship's power plant. Reactor plant performance, reliability, and safety are maintained through a full understanding of component performance and system condition over the life of each ship. Naval Reactors is developing components to address known limitations and to improve reliability of instrumentation and power distribution equipment to replace aging, technologically obsolete equipment. Additional technology development in the areas of chemistry, energy conversion, instrumentation and control, plant arrangement, and component design will continue to support the Navy's operational requirements.

The \$118 million requested for Materials Development and Verification funds material analyses and testing to provide the high-performance materials necessary to ensure that naval nuclear propulsion plants meet Navy goals for extended warship operation and greater power capability. More explicitly, materials in the reactor core and reactor plant must perform safely and reliably for the extended life of the ship.

The \$179 million requested for Evaluation and Servicing sustains the operation, maintenance, and servicing of Naval Reactors' operating prototype reactor plants. Reactor core and reactor plant materials, components, and systems in these plants provide important research and development data and experience under actual operating conditions. These data aid in predicting and subsequently preventing problems that could develop in Fleet reactors. With proper maintenance, upgrades, and servicing, the two prototype plants will continue to meet testing needs for at least the next decade.

Evaluation and Servicing funds also support the implementation of a dry spent fuel storage production line that will put naval spent fuel currently stored in water pits at the Idaho Nuclear Technology and Engineering Center and at the Expanded Core Facility (ECF) on the Naval Reactors facility in Idaho into dry storage. Additionally, these funds support ongoing decontamination and decommissioning of inactive nuclear facilities at all Naval Reactors sites to address their "cradle to grave" stewardship responsibility for these legacies, and minimize the potential for any environmental releases.

The \$64.6 million requested for Advanced Test Reactor Operations and Test Support sustains the ongoing activities of the INL ATR facility, owned and operated by the Office of Nuclear Energy, Science, and Technology.

In addition to the budget request for the important technical work discussed above, program direction and facilities funding is required for continued support of the Program's operations and infrastructure. The \$57 million requested for facilities operations will maintain and modernize the Program's facilities, including the Bettis and Knolls laboratories as well as ECF and Kesselring Site Operations (KSO), through capital equipment purchases and general plant projects. The \$2.8 million requested for construction funds will be used to complete construction of a materials development facility and to support the design of a materials research technology complex. Finally, the \$31.2 million requested for program direction will support Naval Reactors' DOE personnel at headquarters and the Program's field offices, including salaries, benefits, travel, and other expenses.

Office of the Administrator

The fiscal year 2007 budget request of \$387 million is an increase of 14.2 percent over the fiscal year 2006 appropriation. NNSA completed the reengineering of its Federal workforce last year and has begun to recruit to fill critical skill gaps in safety, security, facilities, and business positions, in addition to the Future Leaders Intern program initiated in fiscal year 2005. The fiscal year 2007 request increases to provide additional personnel and support for mission growth in the Defense Nuclear Nonproliferation area, as well as in safety and security functions. The remainder of the increase reflects functional transfers to NNSA of 18 people from other Departmental elements, and fact of life changes including pay adjustments, increased space and occupancy charges, and cost of living increases in pay and benefits. We plan to support a slightly higher workforce level than in previous years, reflecting support for mission growth areas and skill gap closures.

Historically Black Colleges and Universities Support

A research and education partnership program with the Historically Black Colleges and Universities (HBCU) and the Massie Chairs of Excellence was initiated by Congress in the Office of the Administrator appropriation in fiscal year 2005 and fiscal year 2006. NNSA has established an effective program to target national security research opportunities for these institutions to increase their participation in national security-related research and to train and recruit HBCU graduates for employment within NNSA. The NNSA's goal is a stable \$10 million effort annually. The majority of the efforts directly support program activities, and it is expected that programs funded by the Weapons Activities, Defense Nuclear Nonproliferation and Naval Reactors appropriations will fund research with the HBCUs in areas including engineering, radiochemistry, material and computational sciences and sensor development. A targeted effort in education and curriculum development, and support for the Massie Chairs, will also be continued.

MANAGEMENT ISSUES

NNSA has fully embraced the President's Management Agenda through the completion of the NNSA re-engineering initiative by creating a more robust and effec-

tive NNSA organization. Additionally, NNSA's success has been recognized with consistently "Green" ratings from the DOE, including Budget and Performance Integration. NNSA's Planning, Programming, Budgeting and Evaluation (PPBE) process was implemented simultaneously with the standup of the new NNSA organization, and is now the established management construct that integrates management, financial data and performance information in a multi-year context.

The PPBE process is in its fifth year of implementation, and provides a fully integrated, multi-year perspective. The linkages within NNSA mirror the Headquarters and field organization structures, and are supported by management processes, contracting, funds control and accounting documentation. The cascade and linkages are quite evident in our updated NNSA Strategic Plan, issued last November.

We take very seriously the responsibility to manage the resources of the American people effectively and I am glad that our management efforts are achieving such results.

Finally, to provide more effective supervision of high-hazard nuclear operations, I have established a Chief, Defense Nuclear Safety position and appointed an experienced safety professional to the position. I believe this will help us balance the need for consistent standards with my stress on the authority and responsibility of the local site managers.

CONCLUSION

In conclusion, I am confident that we are headed in the right direction. Our budget request will support continuing our progress in protecting and certifying our nuclear deterrent, transforming our stockpile and infrastructure, reducing the global danger from proliferation and weapons of mass destruction, and enhancing the force projection capabilities of the U.S. nuclear Navy. It will enable us to continue to maintain the safety and security of our people, information, materials, and infrastructure. Above all, it will meet the national security needs of the United States in the 21st century.

Mr. Chairman, this concludes my statement. A statistical appendix follows that contains the budget figures supporting our request. My colleagues and I would be pleased to answer any questions on the justification for the requested budget.

NATIONAL NUCLEAR SECURITY ADMINISTRATION
 APPROPRIATION AND PROGRAM SUMMARY TABLES
 OUTYEAR APPROPRIATION SUMMARY TABLES
 FISCAL YEAR 2007 BUDGET TABLES

**National Nuclear Security Administration
 Appropriation and Program Summary**
 (dollars in millions)

	FY 2005 Current Appropriations	FY 2006 Original Appropriation	FY 2006 Adjustments	FY 2006 Current Appropriation	FY 2007 Request
National Nuclear Security Administration (NNSA)					
Office of the Administrator.....	363.4	341.9	-3.4	338.5	386.6
Weapons Activities (after S&S WFO offset)	6,625.5	6,433.9	-64.3	6,369.6	6,407.9
Defense Nuclear Nonproliferation	1,508.0	1,631.2	-16.3	1,614.8	1,726.2
Naval Reactors	801.4	789.5	-7.9	781.6	795.1
Total, NNSA	9,298.3	9,196.5	-92.0	9,104.5	9,315.8

NOTE: The FY 2006 column includes an across-the-board rescission of 1 percent in accordance with the Department of Defense Appropriations Act, 2006, P.L. 109-148.

The NNSA budget justification contains information for five years as required by Sec. 3253 of P.L. 106-065. This section, entitled Future-Years Nuclear Security Program (FYNSP), requires the Administrator to submit to Congress each year the estimated expenditures necessary to support the programs, projects and activities of the NNSA for a five year fiscal period, in a level of detail comparable to that contained in the budget.

**Outyear Appropriation Summary
 NNSA Future-Years Nuclear Security Program (FYNSP)**
 (\$ in millions)

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
NNSA					
Office of the Administrator.....	387	394	402	410	418
Weapons Activities (after S&S offset).....	6,408	6,536	6,667	6,800	6,936
Defense Nuclear Nonproliferation	1,726	1,761	1,796	1,832	1,869
Naval Reactors	795	811	827	844	861
Total, NNSA	9,316	9,502	9,692	9,886	10,084

Weapons Activities
Funding Profile by Subprogram

(dollars in thousands)

	FY 2005 Current Appropriation	FY 2006 Original Appropriation	FY 2006 Adjustments	FY 2006 Current Appropriation	FY 2007 Request
Weapons Activities					
Directed Stockpile Work.....	1,351,206	1,386,189	-13,862	1,372,327	1,410,268
Science Campaign.....	277,253	279,464	-2,794	276,670	263,762
Engineering Campaign.....	258,767	250,411	-2,504	247,907	160,919
Inertial Confinement Fusion Ignition and High Yield Campaign ..	536,756	549,073	-5,491	543,582	451,191
Advanced Simulation and Computing Campaign.....	698,196	605,830	-6,058	599,772	617,955
Pit Manufacturing and Certification Campaign.....	263,570	241,074	-2,411	238,663	237,598
Readiness Campaign.....	265,472	218,755	-2,188	216,567	205,965
Readiness in Technical Base and Facilities.....	1,657,712	1,647,885	-3,130	1,644,755	1,685,772
Secure Transportation Asset.....	199,709	212,100	-2,121	209,979	209,264
Nuclear Weapons Incident Response.....	98,427	118,796	-1,188	117,608	135,354
Facilities and Infrastructure Recapitalization Program.....	313,722	150,873	-1,508	149,365	291,218
Environmental Projects and Operations.....	0	0	0	0	17,211
Safeguards and Security.....	751,929	805,486	-7,735	797,751	754,412
Subtotal, Weapons Activities.....	6,672,719	6,465,936	-50,990	6,414,946	6,440,889
Use of Prior Year Balances.....	-16,372	0	-13,349	-13,349	0
Security Charge for Reimbursable Work.....	-30,000	-32,000	0	-32,000	-33,000
Transfer to the Office of the Administrator for Pajarito.....	-3,205	0	0	0	0
Undistributed Budget Authority ^a	2,400	0	0	0	0
Total, Weapons Activities.....	6,625,542	6,433,936	-64,339	6,369,597	6,407,889

^a Results from application of the 0.8 percent across-the-board rescission against the gross Weapons Activities appropriation prior to receipt of the \$300,000,000 which was derived by transfer from the Department of Defense in accordance with Public Law 108-447.

NOTE: The FY 2006 adjustments column includes an across-the-board rescission of 1 percent in accordance with the Department of Defense Appropriations Act, 2006, P.L. 109-148. It also reflects the approval of the following reprogrammings for Readiness in Technical Base and Facilities using prior year funding—Savannah River General Plant Projects and Project 03-D-102, National Security Sciences Building.

Public Law Authorization:

P.L. 109-163, National Defense Authorization Act, FY 2006

P.L. 109-103, Energy and Water Development Appropriations Act, 2006

Outyear Funding Profile by Subprogram

(dollars in thousands)				
	FY 2008	FY 2009	FY 2010	FY 2011
Weapons Activities				
Directed Stockpile Work	1,381,893	1,431,364	1,462,287	1,494,962
Science Campaign	282,223	281,344	274,296	268,441
Engineering Campaign	169,012	152,114	149,639	147,584
Inertial Confinement Fusion Ignition and High Yield Campaign	426,035	415,222	414,823	400,013
Advanced Simulation and Computing Campaign	632,095	621,943	607,746	593,761
Pit Manufacturing and Certification Campaign	249,588	252,174	260,096	255,832
Readiness Campaign	202,636	198,090	192,401	187,659
Readiness in Technical Base and Facilities	1,767,586	1,833,813	1,907,510	2,008,941
Secure Transportation Asset	225,057	237,344	244,212	247,580
Nuclear Weapons Incident Response	137,766	140,019	142,332	144,701
Facilities and Infrastructure Recapitalization Program	310,369	339,257	368,054	396,996
Environmental Projects and Operations	17,518	17,805	18,099	18,400
Safeguards and Security	768,269	781,279	794,608	808,235
Subtotal, Weapons Activities	6,570,047	6,701,768	6,836,103	6,973,105
Security Charge for Reimbursable Work	-34,000	-35,000	-36,000	-37,000
Total, Weapons Activities	6,536,047	6,666,768	6,800,103	6,936,105

Major Outyear Considerations

(dollars in thousands)				
	FY 2008	FY 2009	FY 2010	FY 2011
Weapons Activities	6,570,047	6,701,768	6,836,103	6,973,105

Defense Nuclear Nonproliferation

Funding Profile by Subprogram

(dollars in thousands)

FY 2005 Current Appropriation	FY 2006 Original Appropriation	FY 2006 a Adjustments	FY 2006 Current Appropriation	FY 2007 Request
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Defense Nuclear Nonproliferation and Verification

Nonproliferation Research and Development....	219,836	322,000	-3,220	318,780	268,887
Nonproliferation and International Security	143,764	75,000	-750	74,250	127,411
International Nuclear Materials Protection and Cooperation.....	403,451	427,000	-4,270	422,730	413,182
Global Initiatives for Proliferation Prevention	40,675	40,000	-400	39,600	0
HEU Transparency Implementation ^a	20,784	19,483	-195	19,288	0
Elimination of Weapons-Grade Plutonium Production.....	67,331	176,185	-1,762	174,423	206,654
Fissile Materials Disposition	619,060	473,508	-4,735	468,773	637,956
Offsite Recovery Project	7,540	0	0	0	0
Global Threat Reduction Initiative	0	97,975	-980	96,995	106,818
Subtotal, Defense Nuclear Nonproliferation	1,522,441	1,631,151	-16,312	1,614,839	1,760,908
Use of Prior Year Balances	-14,475	0	0	0	-34,695
Total, Defense Nuclear Nonproliferation.....	1,507,966	1,631,151	-16,312	1,614,839	1,726,213

NOTE: The FY 2006 column includes an across-the-board rescission of 1 percent in accordance with the Department of Defense Appropriations Act, 2006, P.L. 109-148.

Public Law Authorization:

P.L. 108-148, The Consolidated Appropriations Act, 2006

^a This budget request includes an across-the-board rescission of 1 percent for FY 2006 in accordance with the Department of Defense Appropriations Act 2006, P.L. 109-148.

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2008	FY 2009	FY 2010	FY 2011
Defense Nuclear Nonproliferation				
Nonproliferation and Verification Research and Development	279,439	293,924	311,551	324,034
Nonproliferation and International Security.....	132,458	134,706	138,835	146,990
International Nuclear Materials Protection and Cooperation	403,351	444,405	530,723	542,859
Elimination of Weapons Grade Plutonium Production	182,017	139,363	24,949	0
Fissile Materials Disposition.....	642,853	654,469	710,178	737,976
Global Threat Reduction Initiative.....	120,619	129,085	115,635	116,649
Total, Defense Nuclear Nonproliferation	1,760,737	1,795,952	1,831,871	1,868,508

Major Outyear Considerations

(dollars in thousands)

	FY 2008	FY 2009	FY 2010	FY 2011
Defense Nuclear Nonproliferation	1,760,737	1,795,952	1,831,871	1,868,508

NNSA describes major outyear considerations at each GPRA-Unit level within this appropriation.

Naval Reactors Funding Profile by Subprogram

(dollars in thousands)

FY 2005 Current Appropriation	FY 2006 Original Appropriation	FY 2006 Adjustments	FY 2006 Current Appropriation	FY 2007 Request
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Naval Reactors Development (NRD)

Operations and Maintenance.....	765,041	728,800	-7,288	721,512	761,176
Program Direction.....	29,264	30,300	-303	29,997	31,185
Construction..... ^a	7,132	30,400	-304	30,096	2,772
Subtotal, Naval Reactors Development.....	801,437	789,500	-7,895	781,605	795,133
Use of Prior Year Balances.....	0	0	0	0	0
Total, Naval Reactors.....	801,437	789,500	-7,895	781,605	795,133

NOTE: The FY 2006 column includes an across-the-board rescission of 1 percent in accordance with the Department of Defense Appropriations Act, 2006, P.L. 109-148.

Public Law Authorization:

P.L. 83-703, "Atomic Energy Act of 1954"

"Executive Order 12344 (42 U.S.C. 7158), "Naval Nuclear Propulsion Program"

P.L. 107-107, "National Defense Authorization Act of 2002", Title 32, "National Nuclear Security Administration"

P.L. 108-375, National Defense Authorization Act, FY 2005

P.L. 108-447, The Consolidated Appropriations Act, 2005

P.L. 109-163, National Defense Authorization Act, 2006

Outyear Funding Schedule

(dollars in thousands)

	FY 2008	FY 2009	FY 2010	FY 2011
Naval Reactors.....	811,036	827,257	843,802	860,678

^a In the Conference report to Public Law 109-103, Congress directed that NR transfer \$13.5 million to DOE-NE to support the Advanced Test Reactor (ATR) Life Extension Program (LEP). However, the report included the \$13.5 million specified for ATR under the Construction Heading vice Operations and Maintenance. The additional \$13.5 million has been transferred to NE to support the LEP (NR total transfer to NE for ATR in FY 2006 was \$70.8 million). Actual NR Construction requirements in FY 2006 are \$16.9 million.

Major Outyear Considerations

(dollars in thousands)

	FY 2008	FY 2009	FY 2010	FY 2011
Naval Reactors				
Operations and Maintenance.....	765,186	777,407	780,702	804,078
Program Direction.....	32,700	33,900	35,100	35,900
Construction.....	13,150	15,950	28,000	20,700
Total, Naval Reactors.....	811,036	827,257	843,802	860,678

NNSA describes major outyear considerations at each GPRA-Unit level within this appropriation.

Senator SESSIONS. Thank you.
Secretary Rispoli.

**STATEMENT OF JAMES A. RISPOLI, ASSISTANT SECRETARY
FOR ENVIRONMENTAL MANAGEMENT, U.S. DEPARTMENT OF
ENERGY**

Mr. RISPOLI. Good afternoon, Chairman Sessions, Senator Nelson, Senator Graham, other members of the subcommittee. I'm pleased to be here today to answer your questions on the fiscal year 2007 budget request in EM. I want to thank you and this subcommittee for your support. Over the last 4 years, we have made major strides in achieving results. We have made significant progress in shifting focus from risk management to real risk reduction and cleanup, an achievement not possible without the strong leadership and support of this subcommittee.

During 2006 we expect to complete regulatory actions associated with closure of the Rocky Flats site and to complete cleanup at up to eight other sites, including Fernald, Mound, Columbus and Ash-tabula in Ohio—I would note that as of now, we have a congressional add from last year that added some scope to the work at Mound which will be done during 2007—the Lawrence Livermore National Lab main site, Lawrence Berkeley National Lab in California, the Kansas City plant in Missouri, and the Sandia National Laboratory site in New Mexico.

With this 2007 budget request, achieving our short-term completion goals for risk reduction and cleanup are achievable with the intention to complete cleanup of eight more sites by 2009. Just a few examples of these are the contamination issues of the Pantex Plant in Texas, the East Tennessee Technology Park in Tennessee, the Lawrence Livermore National Lab Site 300 in California, and the Energy Technology Engineering Center in California.

As with many complex and diversified programs, challenges are not always apparent. The challenges that we face in the cleanup are not always attractive. EM foresaw some of these challenges, but others were not foreseen or were unexpected. We have taken steps to regain momentum on these projects, but we are realistic and recognize that overly optimistic assumptions, statutory and legal issues, and some unrealized technology advancement have led us to setbacks.

One of the most visible projects on which our progress has slowed is the Waste Treatment Plant at Hanford which was mentioned earlier. We believe the Waste Treatment Plant project you referred to is the largest and most complex construction project in the Nation. It has encountered significant design and construction setbacks.

As we know, the Department has received, and this was mentioned as well, the report from the After Action Review team. With the help of that report, we have identified problems specific to this project and also some problems that we recognize could be systemic problems in the national program. We remain committed to fix these problems and complete the project and begin operations to treat the significant tank waste issues there at the Hanford site.

The investment we have requested in our 2007 budget for Defense EM activities totals \$5.4 billion and consists of one Defense

appropriation, that of Defense environmental cleanup. With that investment, we will focus and emphasize on the following three areas. First, ensure that safety is number one. I don't mean safety for just the workers. I mean safety for the site and for the community around the site.

We place a premium on protecting the workers and the environment, and we are introducing an integration of safety and project management. What I'm getting to there is that safety has to be included in all of the design aspects for these projects, not just the operational aspect, that has begun at the earliest stages of design aspects. It's absolutely essential to superior performance.

Second, we need to ensure the appropriate levels of safeguards and security. It's crucial that we maintain vigilance in our security to protect our citizens. The EM program is responsible for tons of surplus nuclear material. There is an overall increase in the safeguards and security budget for EM in 2007.

Third, we need to ensure risk reduction and cleanup completion. Risk reduction requires a pragmatic approach to cleanup and occurs in various stages which involve the elimination, prevention, or mitigation of risk. Our major focus of risk reduction is stabilization of high risk materials through validation and adherence to cost and schedule targets, effective identification and management of risk, and the design of contracts that drive outstanding performance.

A small selection of planned activity and milestones at two of our largest sites in 2007 are at Hanford, to ramp up construction of the waste treatment plant that's been referred to, to maintain radioactive waste forms in a safe, compliant condition, and continue on with single shell tank waste retrievals and complete containerization and consolidation of the K-West Basin and sludge at the K-West Basin.

At the Savannah River Site (SRS), we will complete consolidation of on-site plutonium, continue to stabilize radioactive liquid-based underground storage tanks, and complete the shipment of drum legacy transuranic waste to the Waste Isolation Pilot Plant (WIPP). In particular, I'm pleased to thank this subcommittee for section 3116 from the National Defense Authorization Act for Fiscal Year 2005 that enables us to dispose of low level waste at SRS and other sites in a prudent, safe, and compliant way.

The first determination using this statutory authority was made by the Secretary in January 2006 and we have two more wastes in the pipeline right now for similar action. Significant results and emerging challenges went hand in hand last year. The fiscal year 2007 budget request supports a critical portion of the Department's environmental stewardship responsibilities. We will build on our successes in EM missions in a manner that is protecting the environment.

I'm committed to working with all interested parties to resolve these issues and work with this subcommittee and Congress to address any of your concerns. The Senate Armed Services Committee, and this subcommittee in particular, are key supporters of our Nation's cleanup efforts. I look forward to a continuing dialogue with you on this subcommittee.

This concludes my formal statement and my full statement is submitted for the record. I'd be pleased to answer any questions.

[The prepared statement of Mr. Rispoli follows:]

PREPARED STATEMENT BY JAMES A. RISPOLI

Good Afternoon, Chairman Sessions and members of the subcommittee. I am pleased to be here today to answer your questions on the fiscal year 2007 budget request for the Environmental Management (EM) program. I want to thank you and your subcommittee for your support of the EM program.

Since my appointment in August 2005, I have been visiting Department of Energy (DOE) sites and familiarizing myself with the breadth of work that EM has the crucial mission to accomplish. I have been impressed with the dedication and focus of the workforce to remedy the environmental legacy of the Cold War, a task that is both inherently challenging and innately beneficial to our country. As I have become more informed on the sheer immensity of the challenges that face the program, I have a greater understanding of the progress we have made and the significant challenges that lie before us.

Over the last 4 years, EM has made major strides in achieving results. To our credit, the program has made significant progress in shifting focus from risk management to risk reduction and cleanup completion, an achievement not possible without the strong leadership and support of this committee. In fact, in 2005, we physically completed the cleanup of the Rocky Flats site, Colorado, produced 257 canisters of vitrified high level waste at the Savannah River Site (SRS), South Carolina, ready for repository disposal, and completed the Melton Valley legacy waste cleanup at the Oak Ridge Reservation, Tennessee, while beginning the decontamination and decommissioning of the last remaining gaseous diffusion plant facilities at Oak Ridge. During 2006, we expect to complete regulatory actions associated with Rocky Flats closure and complete cleanup at up to eight other sites. The eight other sites targeted for cleanup completion and/or closure are:

- Fernald, Ohio
- Mound, Ohio¹
- Kansas City Plant, Missouri
- Lawrence Livermore National Laboratory Main Site, California
- Lawrence Berkeley National Laboratory, California
- Ashtabula Environmental Management Project, Ohio
- Sandia National Laboratories, New Mexico
- Columbus Environmental Management Project, Ohio

The fiscal year 2007 budget request builds on the past success of cleanup and closure and sets our course for accomplishing our cleanup responsibilities. The fiscal year 2007 EM budget request is \$5.39 billion for defense activities, a decrease of \$760 million from the fiscal year 2006 appropriation, an indicator of our anticipated success with completion and closure of Rocky Flats in Colorado and several other sites in 2006. The fiscal year 2007 budget request reflects a balance of reducing risk and completing cleanup with other Departmental and national priorities. Overall, our request puts a high priority on tank waste treatment and radioactive waste disposition while preserving our site completion and closure impetus.

This budget request will make possible a ramp up in construction of key components of the Waste Treatment Plant at Hanford, Washington, which had been slowed in 2005 and 2006, and continues safe management and retrieval of waste from single shell tanks at Hanford, in pace with the Waste Treatment Plant delays. This request increases funding for the Advanced Mixed Waste Treatment Project in Idaho to support shipments of transuranic waste to the Waste Isolation Pilot Plant and the construction of the Sodium Bearing Waste Facility to treat liquid tank waste. This request reflects an increase to support the critical path to closure for the East Tennessee Technology Park in Oak Ridge.

At the SRS, this request will support ongoing stabilization of the site's stored nuclear materials, including funding for a container surveillance capability and consolidating the site's own plutonium into a single location. The request also provides for management and disposition of liquid tank waste, including funding for design and construction of the Salt Waste Processing Facility.

In addition, the request supports ongoing cleanup at National Nuclear Security Administration (NNSA) sites, such as the Nevada Test Site, Pantex Plant, and Lawrence Livermore-Site 300. It also supports the first full year of remote-handled transuranic waste disposal at the Waste Isolation Pilot Plant in New Mexico.

¹With the possible exception of OU-1, which is being addressed now as a result of fiscal year 2006 Appropriations Act direction.

With this budget request, our short-term completion goals for risk reduction and cleanup are achievable, with the intention to complete cleanup of eight more sites by 2009. They are:

- Argonne National Laboratory-East, Illinois
- Pantex Plant, Texas
- East Tennessee Technology Park, Tennessee
- Lawrence Livermore National Laboratory-Site 300, California
- Stanford Linear Accelerator Center, California
- Energy Technology Engineering Center, California
- Brookhaven National Laboratory, New York
- Inhalation Toxicology Laboratory, New Mexico

The structure of fiscal year 2007 congressional budget request focuses on each site. This structure has three appropriations: Defense, Non-Defense, and Uranium Enrichment Decontamination and Decommissioning. This structure will allow the consolidation of all site activities for visibility, accountability and performance. With this fiscal year 2007 budget request, we are proposing several shifts between program offices with the completion of cleanup.

- With the completion of cleanup at Rocky Flats in fiscal year 2006, this request transfers site responsibility from EM to the Office of Legacy Management. However, EM's request does include funding for Rocky Flats for the final Comprehensive Environmental Response, Compensation and Liability Act Record of Decision.
- With the physical completion of cleanup work at Fernald, this request transfers responsibility from EM to the Office of Legacy Management for Fernald.
- This request transfers the work scope associated with the Nevada Offsites (Project Chariot, Amchitka Island, and the Salmon Site; Central Nevada Test Area, Gasbuggy Site, Gnome Coach Site, Project Shoal Area, Rio Blanco Site, and the Rulison Site) from EM to the Office of Legacy Management.
- This request transfers long-term response actions at the Lawrence Berkeley National Laboratory from EM to the Office of Science.
- With completion of active remediation work planned in fiscal year 2006 at Sandia National Laboratory, Kansas City Plant, and Lawrence Livermore National Laboratory-Main Site, this request transfers long-term response actions from EM to the NNSA.

EM envisions that as cleanup work is completed at sites with continuing missions, EM will transfer long-term surveillance and monitoring activities to the cognizant program office or, for those sites without a continuing mission, to the Office of Legacy Management.

Your support of this request will keep the cleanup program on track to meet the commitments and produce results worthy of the investment of the American people. We have shown we can deliver meaningful results important to accomplishing a technically complex mission. With your support, we will continue to show results important for today as well as far into the future.

RESULTS AND CHALLENGES

The risk reduction, cleanup completion strategy has borne key results. We will build on this success and commit our efforts to refine our processes, taking advantage of opportunities and breakthroughs to meet or exceed past expectations of performance. For instance, as of the end of last year EM had cumulatively accomplished the following:

- Packaged and certified 5,541 containers of enriched uranium (out of 9,110 containers required over the cleanup lifecycle) for long-term storage.
- Packaged 11,307 metric tons of depleted uranium (out of 685,161 metric tons required over the cleanup lifecycle) in a suitable form for disposition.
- Disposed of 960,143 cubic meters of legacy low-level waste and mixed low-level waste (contaminated with hazardous chemicals), out of 1,532,871 cubic meters required over the cleanup lifecycle.
- Eliminated 9 out of the 13 highly secure and costly special nuclear materials storage areas, or Material Access Areas.
- Completed decommissioning, deactivation, dismantlement and/or demolition of 1,106 out of 3,113 industrial facilities.
- Completed remediation of a total of 5,858 release sites (that is, discrete areas of contamination), out of 10,516 release sites required over the cleanup lifecycle.

In addition, on a site-specific level, we have:

- Consulted with the Nuclear Regulatory Commission under section 3116 of the National Defense Authorization Act for Fiscal Year 2005 and made the first waste determination to allow certain low-level waste from reprocessing to be disposed of onsite at the SRS in South Carolina, thereby reducing the risks associated with the approximately 36.4 million gallons of radioactive waste stored in the underground tanks there.
- Retrieved the first 13,000 of 75,000 drum equivalents of suspect transuranic waste 5 months ahead of the Tri-Party Agreement (TPA) regulatory milestone at Hanford in Washington.
- Completed the first “wet to dry” spent nuclear fuel transfer campaign at the Idaho National Laboratory, with Training Research and Isotope Production, General Atomics (TRIGA) spent nuclear fuel now being held in dry storage.
- Completed disposal of all low-level waste generated during the Cold War era (>12,000 cubic meters) 1 year early at the Savannah River Site.
- Disposed of over 8,000 tons of scrap metal from Portsmouth, Ohio.
- Completed disposal of the remaining inventory of hazardous waste generated during the Cold War era and over 8,000 cubic meters of polychlorinated biphenyl (PCB)—contaminated low-level waste from Oak Ridge, Tennessee.

These results provide only one perspective or “snapshot” of the progress EM has made in risk reduction and cleanup. As with a photo, these accomplishments present only a limited view of the total program. With EM, as with many complex and diversified programs, the challenges behind achieving these results are not always apparent. EM foresaw some of these challenges, but other challenges were unexpected. Some challenges assail us from the technology perspective as we face some of the most difficult issues in environmental cleanup. Other challenges do not necessarily manifest themselves until we experience poor performance or missed milestones. More recently, due to poor performance and inadequate oversight, we have been challenged with losing ground in completing design and construction on some key projects. We are taking steps to regain momentum we have lost on these projects, but we are realistic and recognize that overly optimistic assumptions, statutory and legal issues, and unrealized technology advancements have led us to setbacks we are now experiencing within several key projects across the program.

One of the most visible projects on which our progress has slowed is the Waste Treatment Plant at Hanford. The Waste Treatment Plant project perhaps the largest, most complex environmental construction project in the Nation has encountered design and construction setbacks. We remain committed to fix the problems, complete the project, and begin operations to treat the radioactive tank waste at the site. We have both internal and independent external reviews underway to evaluate the major project management, project control, business, and technical systems and processes, to ensure we fully understand what is required to complete the project and begin operations. An After Action Review by an external independent firm to assess the causes of the issues surrounding the project was recently completed. Actions are currently being implemented as appropriate to ensure the project is being planned and executed responsibly, to bring it back to acceptable performance.

Other examples of challenges to cleanup progress include delays in facility design and construction in South Carolina to address protection of workers under certain accident scenarios associated with postulated seismic events, delays in sludge cleanup from spent nuclear fuel basins in Washington to address more difficult conditions than foreseen and allocation of cleanup resources to allow us to implement security upgrades to safely store our special nuclear materials. We are establishing realistic project baselines to account for these developments and to refocus our efforts.

We are addressing these challenges while strengthening our ability to address future challenges. For example, we have had performance issues with EM work at Los Alamos and have not had an integrated baseline yet that we are able to validate. But we are making significant progress toward a new baseline. Additionally, we have a new contract in place that is focused on finding new ways of doing business in all areas of site operations, including cleanup and waste disposition. We believe the new contract and a successful baseline validation will offer us new opportunities to continue significant risk reduction and cleanup with our fiscal year 2007 funding.

We have demonstrated that we can deliver. We will not falter in our responsibilities to meet our mission objectives. We have and are taking immediate steps to strengthen our performance by refining processes to emphasize safety, project management, acquisitions, contract execution and human capital.

RENEWED EMPHASIS

First and paramount to our success is safety—it is our top priority. Safety affects all involved—Federal employees, contractors, the site, and the community. We will continue to maintain and demand the highest safety performance in all that we do. We have taken steps to fully integrate safety into our project designs earlier than ever, assure our line project teams have the necessary experience, expertise, and training, and utilize a constant real-time feedback of lessons learned. Every worker deserves to go home as healthy as she or he was when they came to the job in the morning. No schedule, no milestone, is worth any injury to our workforce. Safety is a cornerstone in the execution of good project management.

In order to successfully execute our portfolio of projects, we are instilling a rigorous project management mindset that will be ingrained in all projects. Our performance has not been acceptable on several key projects. My goal over the next couple of years is that at least 90 percent of our projectized portfolio will perform on or better than our cost and schedule targets. The management tools used to plan, execute, and monitor projects must be integrated into our business processes. Our success will depend on our ability to build in this rigor. We will target the shortcomings in our project management by using both DOE and industry standard project management and business management tools. I am personally conducting Quarterly Performance Reviews of all EM projects, and have directed my senior staff to carry out monthly project reviews. This includes fully implementing our management systems, following through on corrective actions, and better applying risk management principles—that is, identifying project uncertainties, developing mitigation measures and contingency, and holding responsible managers accountable for their resolution. I believe that this approach, strong and effective project management will be the key to our success.

To ensure effective project management, we must also apply the proper procurement vehicles to meet our acquisition strategy. Clearly, opportunities exist to improve our acquisition practices.

EM is an “Acquisition” organization. We accomplish our mission through procurement and execution of our projects. It is vital that EM acquire the best services and attract the best the contractor community, including small business, has to offer. I have recently proposed and will shortly implement a new organizational structure, including a new Deputy Assistant Secretary (DAS) for Acquisition and Project Management. This new organization will integrate the two functions of procurement planning and project management, a significant step in building up the expertise to carry out our responsibilities. We will sharpen our skills through training and refocus our enterprise to reflect our acquisition responsibilities. With this organizational integration of project management and contract acquisition/administration, EM will be positioned to provide technical excellence commensurate with the responsibilities with which we have been entrusted.

Complementing these refinements, we must ensure that our projects are managed by highly skilled, competent and dedicated leaders and staff, both Federal and contractor, who have the responsibility and the authority to meet the EM program’s objectives. We have in place a rigorous certification program for our project managers. Our goal is to certify all EM Federal project managers for each project by May 2006.

We want to assure ourselves that we have the right skills mix to get the job done. We will provide our employees career development, rewards, and support. I firmly believe that an organization is never better than its people. Our employees, both Federal and contractor, hold the key to our success as an agency.

Our desire is that at Headquarters and each site, our key acquisition and technical personnel have knowledge of technical issues, project management, and business management at an equivalent level of expertise as their contractor counterparts to promote meaningful, cogent dialogue on substantive issues. Our job as a Federal agency is management and oversight, to be responsible stewards of the public’s trust and resources. Therefore, we must have a highly qualified and technically proficient management team and staff. My aim is to have a high performing organization, sustained by a career oriented workforce, driven to produce results that are important now and into the future.

THE FISCAL YEAR 2007 BUDGET REQUEST

The investment we have requested in our fiscal year 2007 budget will continue the Department’s success in achieving its mission of risk reduction and cleanup completion. The Department’s fiscal year 2007 budget request for defense EM activities totals \$5,390 million. The request consists of one defense appropriation, Defense Environmental Cleanup.

Ensure safety is number one: The budget request continues to place the highest priority on protecting workers, the public, and the environment. EM is introducing new fervor in the integration of safety and project management, validation and adherence to cost and schedule baselines, effective identification and management of risks, and the design of contracts that drive outstanding performance. Safety is central to superior performance.

Ensure the appropriate levels of safeguards and security: It is crucial that we maintain vigilance in our security to protect our citizens. The EM program is responsible for tons of surplus nuclear material. There is an overall increase in the safeguards and security budget in fiscal year 2007 due to additional security requirements at Savannah River, as a result of revisions to the Department's Design Basis Threat (DBT) policy—the performance based standard, which each of our sites must meet to ensure an acceptable level of protection. Hanford has fully met the 2003 DBT policy, and will be reviewing the 2005 DBT policy as the Department is considering options for consolidation of special nuclear material throughout the complex.

Risk reduction and cleanup completion: Risk reduction requires a pragmatic approach to cleanup and occurs in various stages, which involve the elimination, prevention, or mitigation of risk. Because safe disposal of many materials will take a number of years to complete, our major focus of risk reduction is stabilization of high-risk materials:

- High-curie, long-lived isotope liquid waste;
- Special nuclear materials;
- Sodium bearing liquid and other radioactive waste in tanks;
- Deteriorating spent nuclear fuel in leaky or poor integrity basins;
- Remote-handled transuranic waste and high transuranic content solid waste stored on the surface;
- Decommissioning of highly-contaminated facilities.

Although these items are to be considered when setting priorities, their relative ranking may vary from site to site. Risk reduction is a major consideration in the development of the site baselines. Examples of planned activities and milestones for fiscal year 2007 that correspond to site-specific risk categories are:

Hanford

- Ramp up construction of the Waste Treatment and Immobilization Plant (WTP) Pretreatment and High-Level Waste facilities.
 - The WTP is the primary facility to immobilize (vitrify) the radioactive tank waste at the Hanford Site. The WTP complex includes five major components: Pretreatment facility, Low-Activity Waste facility, High-Level Waste facility, Analytical Laboratory, and the Balance of Facilities. In fiscal year 2007, construction will ramp up on the two facilities slowed in 2006 to address revised seismic criteria: the Pretreatment facility, which will separate the radioactive tank waste into low-activity and high-level fractions, and the High-Level Waste facility which will vitrify the high-level fraction into glass, ready for disposal at a Federal repository.
- Maintain tank farms in safe, compliant condition and continue single-shell tank waste retrievals to maintain adequate double-shell tank space.
 - The double-shell tank system has limited capacity to receive wastes from the single-shell tanks and that is anticipated to continue to be the case until the WTP can provide tank waste treatment. The fiscal year 2007 budget request supports a reduced rate of single-shell tank waste retrievals that can be sustained with the available double-shell tank capacity until tank waste treatment can commence.
- Complete containerization and consolidation of K-East and K-West Basin sludge in the K-West Basin.
 - The K-Basins are located about one quarter mile from the Columbia River. This project involves removing radioactive sludge, debris, and water from wet storage in the K-Basins to safe, interim storage or final disposition away from the Columbia River. The K-Basin facilities are well past their design lives and are a major threat to the environment due to the potential for basin leakage to the surrounding soil and the Columbia River. The request is an increase over fiscal year 2006 and reflects additional work scope due to more challenging, as-found conditions of sludge and debris; implementation of improved techniques for sludge containerization; and application of a systematic approach to design, testing, and operation of sludge transfer activities.

- Continue retrieval of suspect transuranic waste and shipments to the Waste Isolation Pilot Plant.
 - Hanford has several thousand containers of previously generated suspect transuranic waste stored in the ground in a retrievable configuration. Approximately 2,400 cubic meters of suspect transuranic waste will be retrieved, an increase of approximately 600 cubic meters over fiscal year 2006. Characterization and shipment of confirmed transuranic waste to the Waste Isolation Pilot Plant for final disposal will reduce the risks to facility workers as well as reduce the safeguard and security vulnerability associated with this waste. This action represents final disposal of this waste in an environmentally protective repository.
- Increase River Corridor remedial action activities for Reactor Areas D, F, and H; and complete three high priority waste site interim remedial actions in the 300 area.
 - The River Corridor Closure Project focuses on areas and facilities adjacent to the Columbia River and includes remediation of contaminated waste sites; decontamination, decommissioning, and demolition of facilities; and placing eight reactors into interim safe storage condition. This also includes digging up contaminated soil and disposing of waste in the onsite Environmental Restoration Disposal Facility, an engineered landfill away from the river.
- Maintain Plutonium Finishing Plant (PFP) complex facilities, including vaults.
 - The PFP Complex consists of several buildings that were used for defense production of plutonium nitrates, oxides, and metal from 1950 through 1989. The end state for the PFP is the dismantlement of all facilities to slab-on-grade. The continuing presence of special nuclear materials has caused a delay in decommissioning and decontamination of PFP facilities. However, safe, secure maintenance of the existing facility continues as we finalize plans for consolidation of the material, as does dismantlement and demolition of ancillary PFP facilities.

Idaho

- Continue transuranic waste shipments to the Waste Isolation Pilot Plant.
 - These actions will serve to reduce operating, surveillance, and maintenance costs while at the same time reducing risk and enhancing long-term safety and security.
- Complete design and initiate construction of the Sodium Bearing Waste Treatment facility to treat tank radioactive wastes.
 - This project supports the EM goal of reducing the risk of stored liquid radioactive waste. This action will reduce the potential risk to human health by preventing the potential migration of contamination into the Snake River Plain Aquifer which is a sole source aquifer used to supply water to the people of southeastern Idaho.
- Close the first three emptied underground storage tanks at Idaho.
 - Removing the liquid waste decreases the risks they pose to human health and the environment, including the underlying Snake River Plain Aquifer.
- Initiate final demolition of the Loss of Fluid Test Reactor.
 - This will be the first of four high-risk reactor dispositions under the current cleanup contract. These actions will reduce potential risk by deactivating high risk excess nuclear buildings at the Idaho National Laboratory that have reached the end of their useful lives.

Oak Ridge

- Ship 75 percent of stored contact-handled transuranic waste to the Waste Isolation Pilot Plant.
 - This waste is stored in above grade-storage trenches and in earthen trenches. Processing and off-site disposal of the waste prevents the risk of release to the environment and the continued cost of waste storage and monitoring.
- Initiate remediation field work at David Witherspoon 1630 Site.
 - This action will reduce the risks posed to workers and the surrounding community from uranium and polychlorinated biphenyls contamination in the soil.

- Perform surveillance and maintenance of Building 3019.
 - This action will provide storage of the Uranium-233 inventory in Building 3019 while we evaluate alternatives to disposition the Uranium-233 inventory.

Los Alamos National Laboratory

- Characterize 1,800 cubic meters of contact-handled transuranic waste and prepare oversized transuranic waste items for disposal at the Waste Isolation Pilot Plant.
 - Characterization and shipment of this waste to the Waste Isolation Pilot Project for final disposal will reduce the risks to facility workers as well as reduce the safeguard and security vulnerability associated with this waste. This action represents final disposal of this waste in an environmentally protective repository.

Savannah River Site

- Complete consolidation of on-site plutonium to K Area.
 - This action will consolidate Savannah River's own plutonium from various on-site storage locations into one existing Category 1 Special Nuclear Materials Storage Facility to meet Design Basis Threat criteria.
- Continue to stabilize liquid waste from underground storage tanks.
 - Complete design and initiate site preparation, long lead procurement, and construction of Salt Waste Processing Facility.
 - Produce 250 canisters of vitrified high-level waste.
 - Use the Interim Salt Processing System to develop cesium removal capability.
- Complete treatment of legacy mixed low-level waste and complete shipment of drummed legacy transuranic waste to the Waste Isolation Pilot Plant.
 - Characterization and shipment of this waste to the Waste Isolation Pilot Project for final disposal will reduce the risks to facility workers as well as reduce the safeguard and security vulnerability associated with this waste.

Waste Isolation Pilot Plant

- Complete first full year of remote-handled transuranic waste receipt and disposal.
 - The Waste Isolation Pilot Plant in Carlsbad, New Mexico, is the Nation's mined geologic repository for the permanent disposal of defense-generated transuranic waste. All retrievably stored transuranic waste comes to the Waste Isolation Pilot Plant for receipt, handling, and disposal. This will remove these wastes from around the complex where they constitute a major health and safety risk, into a centralized, safe disposal configuration in New Mexico.

CONCLUSION

Significant results and emerging challenges went hand in hand this last year. We will build on our successes in completing the EM mission in a manner that is protective of the environment and public while demonstrating fiscal responsibility. This fiscal year 2007 budget request supports a critical portion of the Department's environmental stewardship responsibilities. It will enable the next steps in accomplishing the cleanup mission from past operations in support of the Cold War while balancing the effective implementation of other departmental and national priorities for the American people.

I am committed to work with all interested parties to resolve issues and will work with this committee and Congress to address any of your concerns or interests. DOE, our regulators, the communities and our contractors are partners in this effort. Our success relies on this partnership. As a partnership, we all succeed or we all fail together.

The Senate Armed Services Committee and this subcommittee in particular, are key supporters of the Nation's cleanup efforts. I look forward to a continuing dialog with you and the subcommittee. This concludes my formal statement for the record. I will be pleased to answer any questions at this time.

Senator SESSIONS. Thank you, Mr. Secretary. Senator Nelson, I know, has another appointment he must keep and I'd be glad to let you at this time go forward, Senator Nelson, if you'd like to proceed.

Senator BILL NELSON. Thank you, Mr. Chairman. I will confer with the Secretary with regard to that subject matter for you, and we can follow up on the record if we need any additional. Let me concentrate on the Ambassador, though. The National Ignition Facility (NIF), what is being changed in the baseline? What impact will these changes have on the cost of this caper?

Ambassador BROOKS. The baseline for the NIF is remaining on schedule. We continue to be on track to conduct an ignition experiment in 2010. What we have done in order to remain on track is reduce other expenditures, for example, at the Sandia Z Machine and the Omega Machine in Rochester, New York.

Although in the 1990s, the NIF had some project management problems, over the last 5 years, it has been consistently on schedule and on budget. I see it has a remarkable safety record and I see no reason that any of that will change. I expect that we will conduct the first ignition experiment on schedule in 2010.

Senator BILL NELSON. So you see no technological challenges that will not allow you to do the ignition in 2010?

Ambassador BROOKS. I want to be very careful. I know the Secretary doesn't like us to promise things we can't deliver. We can promise we are going to do an ignition experiment in 2010. It's never been done before. Whether or not it will work the first time is something we are just not going to know, but I am confident that we are on track with the budget we have submitted and support we have had in the past for 2010. Yes, sir.

Senator BILL NELSON. How about your funding profile? Have you got enough in order to complete the construction in 2008?

Ambassador BROOKS. Yes, sir.

Senator BILL NELSON. To ignite in 2010?

Ambassador BROOKS. Yes, sir.

Senator BILL NELSON. Let's talk about the RRW. Will there be several RRW types in the stockpile?

Ambassador BROOKS. I think so. Here's what I think will happen, and I need to make it clear, some of these are decisions that have not been made yet and shouldn't be made yet.

We are concentrating first on a warhead that will be suitable for use on several launched ballistic missiles. The reason for that is that the W-76, which is the most numerous warhead on our launched ballistic missiles, is the largest single warhead type in the inventory. Although we have no reason to believe there is a problem with it, were there a problem, we will lack a good deal of flexibility. So what we want to do is give ourselves greater diversity so we want to concentrate on that first.

Ultimately, and ultimately probably means 15 years, maybe 18 years, maybe 20 years, we will need to have more than one type of RRW because we never want to put the United States in a position where a single failure could invalidate the deterrent. But exactly when we start on a second design, I don't think we know, and I don't think we are really going to know until we see the results of this design competition.

Senator BILL NELSON. Is the new nuclear weapon going to use the traditional nuclear weapons acquisition process or is it going to be a modified nuclear weapon process?

Ambassador BROOKS. We are still wrestling with that. The traditional nuclear weapons acquisition process is cumbersome. I think that we believe, consistent with the need to have efficiency, that we need to find a way to streamline that while still providing adequate opportunity for congressional oversight.

I don't want to try and circumvent congressional involvement, but we spend a fair amount of the time within the building that we are going to try and find ways to shorten it. But we have not focused on the details of that yet, other than acknowledging to each other that we need a process. We have a very ambitious goal for responsive infrastructure and those goals will need more efficient management as well as more efficient infrastructure.

Senator BILL NELSON. Would you develop an RRW if you and the laboratory directors determined that it was necessary to conduct a nuclear weapons test?

Ambassador BROOKS. No. But I don't think that's going to come up. In fact, the whole concept of increasing design margin is to decrease the chance of that ever being anything other than a hypothetical question. But in the same way, we are specifying that this first design fit in a particular artillery shell and have the same military characteristics as the existing warheads, we are specifying that it be developed without nuclear testing.

Senator BILL NELSON. The goal of the RRW is to meet the new military requirements?

Ambassador BROOKS. No, sir. Same military requirements. Same military characteristics. Same delivery systems aimed at the same target. The goal is that when my counterparts from the DOD are sitting before this committee in 15 years, they have the same confidence in the stockpile that we have today, even though in those 15 years, nobody has done any testing and everything has gotten older.

Senator BILL NELSON. Okay. My final line of questioning is that you all are planning a life extension for the full complement of W-76, and the full complement of W-80, while both weapons design laboratories are also working on the designs for the RRW. As you said, it could replace some or part of the W-76 life extension.

Now, General Cartwright has recommended that the Air Force and the Navy cruise missiles that carry the W-80 be retired. Between now and the first production of the W-80 warhead in 2010, the NNSA is going to spend a half million dollars getting ready to conduct the life extension program.

So the obvious question is, why not postpone the W-80 work until a final decision is made on whether it's needed or not. If you did not, it would have the result of slowing down the work on the W-76, which you want to have ready.

Ambassador BROOKS. Yes, sir. First, I prefer not to comment on what the senior officer in another department may or may not have recommended, but accepting your characterization for a moment, at the present time, the DOD continues to support and the President has continued to approve the long-term retention of the W-80. Our planning is based on those requirements.

Obviously, if those requirements change, it would be silly to spend money to extend the life of a system with no delivery platform, but I think that's a decision that is now premature. Senator,

a lot of things get considered in government. I think that it is not in the interest of good management to prejudge decisions that have to get made by cabinet officers and the President. I can see my responsibility as meeting the requirements set by the DOD. Right now those requirements require us to do a W-80 life extension. I'm certainly aware that discussions go on, and if things change, we'll change.

Senator BILL NELSON. Thank you, Mr. Chairman. We are concerned that you can't get it all done.

Ambassador BROOKS. Mr. Chairman, can I take just a moment?

Senator SESSIONS. Please.

Ambassador BROOKS. First of all, there are financial issues. These things cost money. The laboratory effort on the RRW does not draw on the same people and skills as life extension programs. I think there are issues of the life extension program which we are working on. Those issues are primarily on the production side, rather than the laboratory side.

I think frankly, the reason to be worried about the number of things we are trying to do is not our fiscal ability, but our physical ability. Right now, the RRW is a relatively small number—sort of frightening to use \$27 million as a small number, but is a relatively small fraction of our budget.

If it has the promise it's going to have, the resources for it will grow. The most logical place to get those resources is from truncating life extension programs. The question that we are wrestling with is how certain do we have to be that the RRW concept is really going to: (A) work, and (B) fit in with the country's priorities before we start shifting resources away. That's a constant discussion. My guess is that in the next year or 2, you will see us walk away from some of the life extension, but that's assuming decisions that have not been made yet.

Senator SESSIONS. Thank you. Senator Nelson, I think that comes back to the point of view that, in many ways, your work at DOE is similar to a contractor producing what DOD says it needs, is that correct?

Ambassador BROOKS. Yes. That's correct.

Senator SESSIONS. In general, you're reluctant to start opining contrary to what the DOD says?

Ambassador BROOKS. It's not just the DOD. The stockpile that we maintain is approved by the President of the United States and I conceive of my job of doing what the President tells me to do.

Senator SESSIONS. He probably has not personally examined it all and probably based on recommendations of DOD. My only point is that sometimes if the two of you got together, we could both save some money it seems.

Ambassador BROOKS. Yes, sir. Some of the new leadership in the weapons area in DOD are General Cartwright, who was mentioned, and Under Secretary Krieg and I are wrestling with that. We are all very conscious that we can do anything but we can't do everything.

Senator SESSIONS. That's what I said. Senator Graham, it's great to have you with us. I would yield to you at this time. Maybe if you would give us a little history lesson and how it was that you and the people of South Carolina were able to speed up your clean-

up and save the taxpayers money at the same time. It's a story too seldom replicated in our Nation.

Senator GRAHAM. What a great lead in. One, you helped us. It was a 48-48 vote and just to make a complete record here, South Carolina was willing to work with the DOE to take 50 tanks that had been filled with waste winning the Cold War, and you come up with a logical way to clean those tanks up, leaving some of the stream behind in a way that was environmentally sound that would speed up cleanup by 23 years and save \$16 billion.

Senator SESSIONS. \$16 billion.

Senator GRAHAM. \$16 billion.

Senator SESSIONS. That's eight DDG ships.

Senator GRAHAM. That could be done throughout the whole system if people would just use common sense. The heel of the tank you could scrape it forever and what comes out of the heel could be sent to Yucca Mountain, clogging it up or you could treat what was left behind and make it low level waste and close these tanks up 23 years ahead of schedule and save \$16 billion. The reason I wanted to do it is the biggest threat to South Carolina is for the tanks to leak.

As soon as you get the material out of the tanks and treat what is left in the heel, you're good to go. I wouldn't ask my State to jeopardize its environment, but I did ask my State to negotiate an agreement that makes sense to allow accelerated cleanup and save money that need not be spent.

Unfortunately, this leads me to my first line of inquiry. The political heat was unbelievable and because of Senator Sessions and others we were able to win the day. What has happened, Mr. Chairman, is that as we get ready to implement the plan that we passed, DOE changed its seismic standards and we are 2 years behind schedule and we really weren't consulted.

I went out on a limb with my governor to allow new standards to be created that would leave a small portion behind that we can stand to have behind. Now we are 2 years behind and it was sort of we were blindsided and the whole effort to get the tanks cleaned up and the waste out has run into problems. Mr. Secretary, where are we and how are we going to get back on schedule?

Mr. RISPOLI. Thank you for that question, Senator. Obviously, we have a very good rapport we believe with the State of South Carolina.

Senator GRAHAM. In all honesty, Mr. Secretary, they were blindsided by the change of seismic standards and it created a lot of problems back home.

Mr. RISPOLI. Yes, sir. We obviously did not do as good as we should have done in coordinating the seismic issue that has been pending for years now. We had to bring it to closure. You're absolutely correct. We did not do a good job of coordinating that seismic standard with the regulatory people of South Carolina.

For clarification for the members of the committee, the issue is not really the seismic standard. The issue is the degree of protection that you provide to the workers in the facility and the site and the community should there be a seismic event. The seismic standard itself was not at issue. It's really the degree of protection, and the decision that was eventually and finally made shortly after I

was sworn in was to go with a higher degree of protection for the workers for the site and for the community because we see that safety has to override any other consideration.

Senator GRAHAM. If I may interrupt, Mr. Secretary, we agree with that. But I don't think I was taking a risk. I thought I was doing something good for South Carolina by agreeing to a plan to get the waste out of the tanks so they won't leak, and I rejected the extreme environmentalist argument that the footprint left cannot be treated because it can. Mr. Chairman, what was left behind is no threat to South Carolina. Why spend \$16 billion cleaning up something that doesn't need to be cleaned up?

But now, we are off track and you're saying that we are worried about our safety. We should have known that before we did this deal.

Mr. RISPOLI. I don't disagree with you. I would point out that we have other steps. Since it's a phased program, we have two other treatment processes that will come on line to begin retrieving tank waste. This is the lower activity tank waste that can be treated through other processes that will begin sooner, so that we don't wait from now until 2011 when the major project is operational to begin to treat.

Senator GRAHAM. So you feel comfortable we are going to get back on schedule?

Mr. RISPOLI. I feel comfortable we will begin treating tank waste with these other processes. We have the waste determination by the Secretary using the 3116 authority that will enable us to close tanks. We want them, just as you do, to get on with closing tanks by removing the waste, treating the waste through these interim processes through the salt waste processing facility when it's built and operational. I believe we have the same exact objectives.

I note again that we felt we had to make the facility safe. Why would we build a facility knowing that it was not meeting technical requirements of the Department?

Senator GRAHAM. Will new tanks be required because of this delay?

Mr. RISPOLI. We do not foresee the need for new tanks. We recognize that we have a tank waste management issue. We believe that by bringing the new facilities, the interim facilities on line, we can deal with the tank waste that will be processed in those and avoid an issue where we would have tank waste and stop it.

Senator GRAHAM. Mr. Chairman, I think this would be good for the committee to hear if you would indulge me. I want to thank the administration in this regard and applaud you. I have been representing SRS in Congress and the Senate for over a decade now. All we did was talk about cleaning up. We spent billions of dollars talking and nothing ever gets cleaned up.

This administration has come along and set some reasonable standards and we are actually beginning to clean things up and South Carolina will be better off if we can neutralize this waste. If we can do it in a common sense way, the taxpayer will be better off, the environment will be better off. I don't want to spend 23 years doing something that doesn't take 23 years and spend \$16 billion for really no gain.

Now, I want to turn to another topic. South Carolina, Mr. Chairman, several years ago, agreed to accept 34 tons of weapons grade plutonium that has been deemed to be excess of our defense needs. We took plutonium from Rocky Flats to South Carolina so they could close Rocky Flats up earlier and save hundreds of millions of dollars in storage.

The deal was you send it to South Carolina and we will convert this excess plutonium, weapons grade plutonium into mixed oxide (MOX) fuel, which is commercial grade fuel. It will take this off the market, it can never be captured by terrorists and used to do bad things because the Russians were going to do the same thing with 34 tons of excess plutonium in their inventory.

I don't worry much about our inventory in terms of being guarded and safe, but I worry a lot about what goes on in Russia. Mr. Chairman, South Carolina stepped up to the plate again and we took plutonium that we did not generate with the hope and the idea, the promise that it would be turned into something. Guess what? It was supposed to start in 2009. Now it's 2015.

So I have 34 tons of weapons grade plutonium. We are way behind schedule. The cost of the MOX program has over doubled and I mention this, Ambassador Brooks, because I think you're bringing some solutions to the table. If you can reassure my chairman and me that we are going to get on with this, South Carolina is not going to be stuck with this plutonium and the world would be safer, I would appreciate it.

Ambassador BROOKS. Yes, sir. Senator, we are going to break ground and begin construction on a MOX fuel vitrification facility later this year, sometime in the early fall. We are working with the Russian Federation to try and find ways to accelerate their elimination of plutonium through using a different approach than we have looked at which would start early use through reactors called the BN-600.

We have, since I was last before this committee, put lead test assemblies into reactors. We have the technical data to confirm that MOX fuel, as the process will manufacture at this particular site and is manufactured in France, will in fact work.

We have Nuclear Regulatory Commission (NRC) licenses so we are going to go ahead. We have been delayed for a variety of reasons, primarily a somewhat arcane and now resolved issue with the Russian Federation over the liability of their program.

We are absolutely committed to eliminating this material for a whole bunch of reasons. Principally because it's part of an agreement with the Russian Federation to eliminate theirs. It frees up space so that I can further consolidate and improve security, and frankly, this is awful stuff we don't need anymore and we need to get rid of it.

We are committed to do that and I think we are going to be showing you tangible proof of that commitment with the construction later this year.

Senator GRAHAM. Thank you, Mr. Ambassador. Thank you both. I know these problems are hard to solve, but I think South Carolina has done its fair share and then some of doing it the right way and economical way and smart way. Mr. Chairman, thank you for your support because without it we could not have gotten this done.

I just think it's important for this committee to provide the oversight. Promises made are promises kept.

Senator SESSIONS. Thank you, Senator Graham. Having been through some of that same type issue with regard to poison gases, sarin at Anniston, people are just not very reasonable in accepting stuff from outside the State. They just don't want to hear it, even though you might be defending them. I was surprised that we won. But it's a problem. South Carolina did the right thing, and it is a commitment that I think you should follow through on.

I also believe that we need to consider further the techniques of cleanups that you did in South Carolina at other sites. Mr. Rispoli, subsequent to their decision, I understand that there was a NRC report that was affirming that procedure. Would you share with us what happened? That was after we had this tight vote that we had in the Senate.

Mr. RISPOLI. Mr. Chairman, I believe you're referring to the consultation that we did with the NRC? The way that that is set up and the way that it's working, we submitted our first consultation in February 2005, following the October passage of the law.

The NRC concluded their consultation which was a back and forth process on December 28, so it was about a 10-month process because I mentioned we have two more in the pipeline with the NRC. One is for tanks 18 and 19. It's a matter for the site in South Carolina. The other is for a similar issue in the State of Idaho.

The report when it was finally concluded was favorable, basically supported the determination that we made. I have been in direct dialogue with the senior executive that works directly for the commission to begin a process to try to improve and streamline it. It took us 10 months to do the first one. It will likely take us 9 months to do the next two.

The NRC has agreed that we need to streamline that process so that we can do this better, faster, and more efficiently. We see this authority that you have supported for us as being absolutely key to prudent solutions of these problems. I just want to make it go smoother because we don't expect this to be the end. We expect this to be the front edge of what we need to do.

Senator SESSIONS. Are these the same kind of tanks and same kind of waste that we are looking at at Hanford?

Mr. RISPOLI. We have single and double shell tanks in both places. The waste is varied at each place. The wastes are quite different depending upon tank height.

Senator GRAHAM. If you were able to get such an agreement at Idaho and Washington, how much sooner could you clean up the tanks at those places and how much money could you save?

Mr. RISPOLI. I think the key to what this statutory authority gave us is the tremendous amount of savings to the American taxpayer by being able to dispose of larger volume, much lower radioactivity content waste in that way, either in the tanks or in the first case, the first one that went through, the salt stone disposal facility where it will be actually put into a repository right onsite. So that the real savings I believe is the monetary savings. In both phases, we run a vitrification plant at Savannah River.

Senator GRAHAM. We saved \$16 billion in South Carolina. Do you have any reason to believe it will be lesser at other sites?

Mr. RISPOLI. No, sir. If you look at volumes of waste, Hanford is a very, very significant challenge for the Nation because of the tank waste we need to deal with there as well.

Senator SESSIONS. Is there a bigger site than Hanford?

Mr. RISPOLI. Mr. Chairman, I would hesitate to speculate because I don't know how much of the waste would be applicable for that type of disposition. Clearly it's a sizable amount. Well over 100 tanks there. Certainly it would be a sizable savings to be able to go through with a similar process.

Senator GRAHAM. Fifty tanks in South Carolina.

Senator SESSIONS. This is a matter we would rather confront. I don't know whether this is a matter of regulation, statute, or consent decree or just an agreement between the State of Washington and DOE. How precisely has the plan been established to go forward in a way different from the South Carolina plant? What is the legal authority for that?

Mr. RISPOLI. If I may explain that the Department initially had the intention of disposing of waste in a way like this. It was being done under departmental directives that were challenged in court, and the initial rulings went against the Department in that case.

The Department appealed, the appeals court found differently than the court that made the initial judgment, and just yesterday, the 6th of March, the initial court set aside its ruling because the argument is that since the Department did not actually propose to do it at Hanford, therefore, the case was not ripe for a judgment, so that was set aside.

The Department is left with its own directive which in many ways parallels Section 3116 authority that you had given to us. What we do not know is if we were to progress on that path again, whether there would once again be third party intervention in bringing the lawsuit against our intention to do that.

Senator GRAHAM. If I may, I think the way it happened, the importance of the legislation that you have passed was it gave legal authority for the DOE in South Carolina to negotiate a deal. It was very much similar to what they had proposed to begin with, and that's where the savings in accelerated cleanup came from.

South Carolina is a huge beneficiary in the sense that we are getting 50 tanks cleaned up 23 years ahead of time, and what is left behind in my opinion presents no danger to the site and does save \$16 billion and we could do this throughout the whole complex.

Mr. RISPOLI. Clearly, the three places this is most applicable would be Savannah River, Idaho, and the Hanford site in Washington State. By the way, the court case was specific to the State of Idaho, as I believe you know.

Senator SESSIONS. So the court case has been set aside, a judgment has been set aside in Idaho. What about the legal status in the State of Washington?

Mr. RISPOLI. The best way I can answer that is that the Department does have its own directive that would permit us to do something very similar and very parallel in the absence of 3116 authority. Obviously, the way that we would like to proceed is to use a prudent, safe and reliable method of doing that since we are talking about disposing in those tanks on site a very low portion of ra-

radioactivity, even though the volume is higher. Clearly that's the way that we would like to proceed with that type of a determination.

Senator SESSIONS. Does it take legislation to allow you to do that or are you saying if do you it you expect someone will file a lawsuit? You think you have the authority today?

Mr. RISPOLI. We have our departmental authority today. We do not have the legal coverage of section 3116 that you provided in the two States that it was specific to.

Senator GRAHAM. South Carolina was willing to be bound by this.

Senator SESSIONS. So the State of Washington perhaps is not.

Mr. RISPOLI. That would be my understanding.

Senator GRAHAM. Yes.

Mr. RISPOLI. I was not in this position at that time, but that would be my understanding.

Senator SESSIONS. I want to just ask this so I get it straight. If you decided that the process utilized in South Carolina is safe and the NRC agrees and you'd like to use it in Idaho, I believe you have the authority to do that. What would be the situation in Washington if you decide to do it there?

Mr. RISPOLI. We would clearly have to work with the State regulatory body, which we, by the way, I believe have very good relations with. We have many significant issues in the State of Washington, primarily caused by the delay in the large Waste Treatment Plant project. We work very well with the State in working our way through those. Clearly we would have to work with the State to propose a path forward to close those tanks at the appropriate time.

Senator SESSIONS. But at this time, is there any agreement in place that says you have to complete or remove the tanks, a commitment on behalf of the DOE?

Mr. RISPOLI. Not that I'm aware of, Mr. Chairman, but I would like to confirm that for the record. Not that I'm aware of.

[The information referred to follows:]

The Department of Energy (DOE) had agreed to several enforceable milestones that relate to tank closures in the Federal Facility Compliance Agreement with State of Washington and Environmental Protection Agency regulators. These milestones set expectations for retrieval of more than 99 percent of the waste preparatory to tank closure. They also recognize that some waste may remain in the tanks. Our current plans are to conduct a waste incidental to reprocessing determination pursuant to DOE Order 435.1, Radioactive Waste Management, and obtain any necessary State approvals prior to closing these tanks. We have informed the State that we will not meet some of the tank closure milestone dates, and we anticipate renegotiation of these milestones in connection with other milestones relating to delays on the completion of the Waste Treatment and Immobilization Plant.

In parallel, the DOE is engaging the public and the State in preparing an environmental impact statement (EIS) which will analyze the environmental implications of alternative means of cleanup of the tanks and residues. A selection of the cleanup alternative will be made available only after public comment on the analysis per the National Environmental Policy Act. Additionally, the single-shell tank closure plan has been submitted to State of Washington regulators in compliance with the Resource Conservation and Recovery Act. The State has informed DOE that it will defer approval of that plan until the EIS is issued.

Senator SESSIONS. I don't want to rush into anything like that and affect people's lives and people who have ideas about it. But

this is a great nation and we do not have an unlimited amount of money, and we have to use reasonable judgment on some of these matters.

Some of the lawsuits that are being filed are being filed by people who do not want us to have any nuclear weapons at all and always oppose nuclear weapons, nuclear power and anything related to it, which is not the consensus of the Nation and never has been the consensus of the Nation. So we have to be careful that somehow we just feel like we have to spend more than we have to. So I hope that you will review that.

With regard to Hanford, let me proceed and discuss some of the details there that concern me. The Waste Treatment Plant project under construction now has been examined lately as an extreme example, and therefore, some might say is not representative of the program. But we are at the point where DOE and Congress are beginning to receive some very thoughtful analysis of what went wrong or is wrong with the project. I would like to quote from some of the recent review findings and ask for your opinion.

I would first note that the panel of outside experts which was chartered by DOE to conduct an after action review described a waste treatment project in this fashion—I would note, Mr. Rispoli, that was before you took office.

So they describe it this way, “the largest and most complex chemical plant design and construction project ever undertaken in the United States and possibly the world.” Given that this is the largest DOE project currently under construction, I was surprised to read the following, again quoting from the after action review, “DOE headquarters was not given copies of the weekly reports nor did they attend the project quarterly reviews. No EM staff at headquarters monitored the status or issues of the Waste Treatment project.”

Now, it’s important to note that this is a project whose cost baseline during this time was increasing from an estimate of about \$6 billion to over \$10 billion, as well as an accompanying schedule delay of approximately 4 years from original plans.

There are over 300 Federal employees at DOE headquarters in the EM program office, as well as additional employees in the DOE’s Office of Engineering and Construction Management. The employees in the Office of Engineering and Construction Management, who were receiving information about the project for over 2 years, accepted project status reports that continually indicated nearly flawless performance of the project against its costs and schedule baseline.

Again, according to the action report, “such reporting should have alerted reviewers that something was amiss. The likelihood of a multibillion dollar project remaining perfectly on schedule and budget month after month is exceptionally low, especially with the technology issues regularly raised in correlated briefing charts available to headquarters.”

My question is what is your understanding of how this reporting situation was allowed to occur and persist? What are the DOE’s guidelines on schedule reporting on projects of this magnitude? In your view, do the systems which are in place on cost and schedule

reporting give the DOE an accurate picture of the current project status?

Mr. RISPOLI. Mr. Chairman, I think that report has been very helpful to us. I think that having read it yourself, you would agree that it's pretty straight from the shoulder and easy to understand what went wrong. I can summarize it this way. There were technical issues at that plant. The cost and schedule targets, the base lines, as we call them, were set very early in the engineering cycle and the technical issue because of its size and complexity were not fully appreciated. I think the report certainly reflects that.

Senator SESSIONS. I don't want to interrupt your thought, having asked you a whole bunch of questions and now I interrupt you. But, I think the implication of the report and review is, my goodness, this was a \$6 billion project that you have, it seemed like there was enough intensity of concern in oversight of it. Would you agree that's one of the thrusts of that report?

Mr. RISPOLI. Yes, sir. I agree that is certainly a thrust of the report.

Senator SESSIONS. Huge.

Mr. RISPOLI. The quotes that you gave, we concur with those findings. I would mention that I've been in the engineering and construction business for over 35 years. It's absolutely essential that when you're running any project, whether it be modest or large or complex or simple, you must simply have monthly reviews to know what is going on. You have to have good data and you have to have monthly reviews and face to face reviews. As that report indicated, those basic tenets of good management of a project were not apparently being reported. We have corrected that.

I, myself, since having been sworn in in August, just finished our second round of quarterly project reviews of all of our projects, of the Waste Treatment Plant. I now get bi-weekly reports on that project, but we have completed face to face quarterly reviews where the site managers come in and we don't keep our staff out of the room.

In fact, we welcome the staff into the room so that they can challenge the information that's being presented and question whether or not we are doing things the best way and whether or not the data is valid. Obviously I mentioned the technical, but the way the project needs to be managed, I can assure you we're managing it that way now. I can think of no other thing we could be doing that we are not doing to manage this project the way it's being managed given its size and complexity.

Third, the report indicated what I would call institutional problems. You would have noted that the staff out there to manage this was like 100 people. There was one contracting officer. We have ordered that more contracting people be hired. We ordered that a contracting attorney be hired. We recognize that we had staff shortfalls so we had difficulties that covered the gamut from technical to project management which most of what you quoted was related to project management, and also institutional issues and we are addressing all of those issues.

Senator SESSIONS. It does sound like you've gotten this under control. The way you explained it is impressive. From what I understand, you understand these kind of project management re-

quirements from the previous experience and that you are bringing some order to that for which we are grateful.

I have to tell you, the taxpayers get tired of it. I don't know how many billion dollars has been misappropriated here or could have been saved with top flight management from the beginning, but this is pretty tiresome. This is a lot of money and we may have to take—they were discussing maybe taking \$3 billion out of the defense budget. That's going to be very painful this year because we have to spend the money somewhere else, somebody says. The point of the matter is as big as this government is, there is not one dollar to waste and I am glad you're moving on top of that and we want to help you.

Mr. RISPOLI. Mr. Chairman, if I may, I would just like to point out, noting that Senator Graham is not with us at this moment, but there is a major difference between the State of South Carolina and the State of Washington, and that is in the State of South Carolina, we have already been vitrifying waste for a number of years. We have already been accomplishing actual processing of tank waste and given the significance of the volume and the nature of the waste at Hanford and the fact that we have not yet built this plant to begin processing waste, I understand why the people of the State of Washington, why we need to work with them so closely because they perceive the same type of thing that you do that we set out to do something. We have not yet succeeded, and I will assure you we are determined to succeed. We are absolutely committed to succeeding in this effort.

Senator SESSIONS. One of the other things I have to ask you because I think the American people are entitled to an answer, the after action review says "the approach"—they talk about lack of staff oversight that "precluded consideration of potentially costly high-risk issues until they came to a head in 2004."

They said the management approach precluded consideration of some of these high risk issues until they came to a head in 2004. "The approach seems intended to allow the waste treatment project to proceed unimpeded long enough so that by the time the cost increases surfaced, senior leaders had little choice but to find the funds to complete the project."

How do you respond to that?

Mr. RISPOLI. I understand what the statement is meant to imply, Mr. Chairman. I think most of us would agree that's speculation. I don't know that anyone can conclusively state that that was the case. Certainly that was the speculation made by the review team that did that after action review.

Senator SESSIONS. Have you taken any steps to take disciplinary action against any contractor or any DOE employees who presumably held positions of high trust who allowed this matter to get to the state it got to? Again, I know this was all before you took office.

Mr. RISPOLI. Yes, sir. I will tell you that when this problem came to the Secretary of Energy's attention, he became personally engaged and we began having regulatory meetings with Mr. Riley Bechtel, the actual owner and name giver to the company that we are dealing with. I can assure you that neither we nor they are happy with our subsequent performance on this effort. Some of the people that were involved are already gone. For example, the re-

views that were not appearing at headquarters, the people engaged with that, many of them have already moved on to other things.

There have been several changes of personnel both among the Federal side and on the contractor side at the site. It is my belief that the problems were not isolated to the site or the feds or the contractor at the site. I think as you can read about it, it was a basic failure of our ability to manage a project of this size.

I again assure you that the Secretary immediately put some actions in place back last July when he was briefed on this subject. He put some very significant actions in place. Then after the first draft of that report where it came to be, we likewise did similar types of things to improve management both at the site and at the headquarters.

Senator SESSIONS. It looks like you began to get control on that. We have some major decisions to make in the future. I hope that you will not be hesitant to speak up on the policy questions to the extent of the cleanup required, the issues that South Carolina has dealt with, and whether or not those same principles could be applied there, and do so in a way that certainly does not shut off or deny people in Washington and Idaho the right to be consulted and discuss it, but fundamentally it's our problem, I say our, Federal Government's, United States. Surely, if we work at it, with good science and care, we will make some progress.

Mr. Ambassador, the Secretary of Energy Advisory Board recently issued a report titled "Recommendations for Nuclear Weapons Complex of the Future." This report, conducted at the direction of Congress and completed by a panel of experts from outside the DOE, envisioned a vastly changed nuclear weapons complex.

The report recommended shutting down current facilities and creating one large "consolidated" new location. A report was prepared at the direction of Congress and attempted to take a fresh look at the nuclear weapons complex as it exists and compared it to the nuclear weapons complex we need now. Among the principal findings of the reports were the following: "The DOD does not provide DOE with unified integrated weapons requirements and the DOD does not appear to trust DOE's ability to respond with predictability."

I guess that's a lot like what Senator Nelson talked about at the beginning. Then it goes on another one: "The DOE has burdened the nuclear weapons complex with rules and regulations that focus on process rather than mission safety." It goes on: "Cost benefit analysis and risk informed decisions are absent, resulting in a risk averse posture at all management levels."

Then in summary, they say this: "The task force found a nuclear weapons complex neither robust nor agile nor responsive with little evidence of a master plan."

This report was issued in July 2005 and was presented to the Secretary of Energy shortly thereafter. It describes a nuclear weapons complex that functions minimally and that as currently configured will not be able to support us in the future, that got an apparently bad grade. Maybe you can call it an F. Why has the DOE not yet put forward a response or a rebuttal of some kind to react to this report? I would think that being criticized in this fashion DOE would feel compelled to respond at least in some way. That's pretty

dramatic criticism, I think. Do you share any of the concerns of this report and can we expect a response?

Ambassador BROOKS. Yes, sir. I think we share most of the concerns of the report. I don't think we disagree in any major way on the assessment of some of the problems. What we are trying to do is figure out a fiscally responsive, responsible way to deal with the solutions. Let me take a couple of the points.

With the new assignment of General Cartwright, with Under Secretary Krieg and Under Secretary Edelman and I, we are working to get greater clarity in DOD requirements. You see this in the very close way the two departments are working together on the RRW. Although this sounds like it's old news, it was actually after much of the analysis was done that the two departments worked together on the very large stockpile reductions announced by the President in the summer of 2004.

We are not yet perfect in this regard, but we are substantially better. The issue of the internal operation of DOE facilities is something that the Secretary and the Deputy Secretary and I are personally working on. We are working on a formal methodology for risk, making risk informed decisions rather than trying to make decisions that are zero risk. I think the criticism that the Department has become risk averse is true.

I think that fixing that while not letting the pendulum swing too far, if you go far enough back in history of this Department and predecessor organizations, you'll find spectacular examples of hurting people. We have not done that in the last 5 years. We want to improve our performance, but we don't want to hurt anybody. So getting that exact balance is something that we are still working on.

There has been no rebuttal to this report because largely we agree. We agree with the report's conclusion that the RRW should be central. We agree with the report's conclusion that there should be accelerated dismantlements and we have been asked in this year's budget for additional funding to dismantle. I expect dismantlement to go up by roughly 50 percent between 2006 and 2007. We agree with the report's requirement or recommendation for the consolidation of nuclear material.

Where the problem comes for us is in this single complex. The report would take facilities at the Pantex plant in Texas, the Y-12 plant in Tennessee, and the plutonium-related work at the Los Alamos National Lab (LANL) and put it all together in a single facility. The report does not specify where that facility might be. The problem is that whatever the merits of doing that, it would require substantially more money than I think we are likely to see in the near term.

Senator SESSIONS. The DOD has been through those things, they call them Base Realignment and Closure Commission (BRAC) and they claim that if you analyze it correctly, you can ascertain whether your savings will be worth it. A lot of times people say it's easier to consolidate, but consolidation may cost more than it's worth. But there are ways, are there not, to analyze whether or not you could improve efficiency and save by some consolidation?

Ambassador BROOKS. Yes, sir. I think the Overskei panel itself has some views, which I think are estimates of potential savings.

All of their estimates are only valid to one significant figure. As they look over 25 years in the future, they believe their recommendations would save a certain amount of money. The problem is you save it in the last 15 years but you spend it in the next 10.

Senator SESSIONS. That is true. Perhaps not that big a deal. DOD's base closures were supposed to pay for themselves in 5 years, or they were not going to close the base. I'm not sure they were accurate. Let me just follow then. But let's ask you this. DOD did not provide you with unified integrated weapons requirements. You've taken steps to make that happen?

Ambassador BROOKS. Yes, sir. We have.

Senator SESSIONS. You should. If there are not sufficient responses there, then I think this Congress can pass legislation that we require the kind of consultation that's necessary.

With regard to the DOE rules that focus on process rather than mission safety, what steps have you taken with regard to that?

Ambassador BROOKS. We are in the process of an extensive internal look to try and decide how we move beyond the present situation of very cumbersome safety rules without moving away from fundamental safety. We are looking at a variety of things. I met with all my Federal site managers on this subject about 10 days ago.

We have had a couple of additional looks, the Secretary and the Deputy Secretary and I met.

Senator SESSIONS. You and the Secretary personally conveyed to your employees that you agree with the report that says that the risk informed decisions are absent and resulting in a risk averse posture?

Ambassador BROOKS. Yes, sir.

Senator SESSIONS. You want that to end?

Ambassador BROOKS. Yes, sir. We have done things to fix that.

Senator SESSIONS. It would take you a while with bureaucracy.

Ambassador BROOKS. I need to be candid with Congress. It has taken us a while to get to where we are and it's going to take us a while to get where we need to be, but we are committed to getting there.

Senator SESSIONS. I'll ask both of you this. We are concerned that DOE has started an effort to make use of alternatively financed construction projects. NNSA already has within it a project that was started without notifying this committee. Apparently it has two additional projects under review that are ready to begin. Ambassador Brooks, how many projects has NNSA started? How many are under review, and how many are planned to begin in fiscal year 2006?

Ambassador BROOKS. There are two projects at Y-12 which are the two where, to be blunt, we screwed up. We notified the appropriators and failed to notify the authorizers. We will not make that mistake again.

The projects, had we properly notified the committee, you would be pleased with because we are saving the taxpayers' money through private financing and we are going to get things that will help consolidate 1,200 people and get us out of a lot of old and expensive and poor facilities. But we should have notified the committee and we did not.

There are those two. There is a project at Los Alamos. I am not aware of anything that is under consideration that has been discussed with me. That doesn't mean I won't have people wandering around the complex thinking of these ideas and I will provide to the committee anything that is under active consideration. I am not aware of anything new.

I am aware that there is a general belief that where it is appropriate, these kind of alternate financing approaches can be beneficial to the taxpayer.

Senator SESSIONS. Congress has to understand what is going on in our oversight capacity.

Ambassador BROOKS. Yes, sir.

Senator SESSIONS. Really, we have some concerns here. I think we want to be more engaged perhaps than we have been in the past in how your plans are going.

Ambassador BROOKS. Certainly, sir. I do not believe there is anything active right now, but I will provide either confirmation of that fact or correction for the record.

[The information referred to follows:]

The process for developing an alternative for financing construction is as follows: The contractor develops (with oversight from the NNSA site office) a proposal that is submitted to the DOE Office of Engineering and Construction Management (OECM) for review. If OECM and the NNSA program believe the proposal has merit, it is submitted to the Office of Management and Budget (OMB) for review and approval. If approved, the contractor will engage a private development firm to secure the financing and land needed for construction. In some cases land is obtained via a lease or deed from NNSA or DOE. If the Department does not provide the land, the commitment of the government is generally limited to reimbursing the contractor for the reasonable cost of leasing the building. This commitment is usually limited at one year's lease cost subject to review each year if the contractor decides to continue to lease the building.

Status of Current Defense Programs Projects:

Los Alamos Science Complex

What was proposed: Bioscience Building proposed to provide LANL with a multi-purpose facility, "for responsive research and development and industrial infrastructure needed to develop, build, and maintain nuclear offensive forces and defensive systems."

Status: Disapproved the analysis found a bias towards the lease alternative and the total rent far exceeded total project cost. Not pursued.

Albuquerque Transportation and Technology Center

What was proposed: Project provides physical facilities to be used in support of the Secure Transportation Asset (STA) program, including capabilities for STA fleet storage.

Status: OMB approval was received and presented to Congress as an alternative lease under GSA. Congress approved. Contractor is seeking financing.

Y-12 Administrative and Technical Support Facilities

What was proposed: Project will provide technical and administrative offices, cafeteria, occupational health clinic, human resources, administrative purchasing, visitors center and badging office, technical computing, and small laboratories for use by the contractor.

Status: Was originally submitted as the Oak Ridge National Security Complex. OECM rejected the proposal, which was reworked by the contractor and resubmitted. The analyses confirmed a valid business case for choosing to proceed with the alternative of private development with operating lease. Reviewed and approved by OMB. Construction is presently underway.

Senator SESSIONS. Secretary Rispoli, how many projects has EM started, how many are under review, and how many are planned for fiscal year 2006?

Mr. RISPOLI. Mr. Chairman, do you mean in the sense of private financing?

Senator SESSIONS. Yes.

Mr. RISPOLI. I'm not aware of any, Mr. Chairman.

Senator SESSIONS. Gentlemen, there may be some more questions that I will submit to you for the record and we'll keep the record open for 2 days for questions. I'm calling on you and I think our full committee would call on you to reaffirm, reestablish your relationship with the Senate to the extent that we know that you are focused on representing the taxpayers' interest in the defense of the United States, that you're prepared to challenge the employees and contractors, most of which are contract employees, in an aggressive way to ensure that the taxpayers are being well-served by the work.

It's a difficult thing. Government works in ways that will never be perfectly efficient. They are just not going to happen. But a good management kind of lead can break down some of the barriers and can be effective. I think many of the problems that we have seen that clearly cost billions of dollars and if not dealt with have cost us billions more in the future represent a lack of will at the management level. With good, strong will and determination, you see what the problems are, how they can be fixed, not take surface answers, dig deeply and challenge some of the ideas that may be percolating can be real helpful to us. I thank you for your work.

Mr. Rispoli, you have a big challenge, I think, with this cleanup. You know it's something we have to do. We will probably spend a billion dollars in Anniston cleaning up poison gas. I can't help but believe we could have done it for less, but we would have done it safely or carefully and we will probably spend \$17 billion cleaning up poison gas facilities around the country. Then we have the nuclear sites.

When you consider the flesh and bone that we need to have a strong national defense, this is money draining away from us. So if we can keep those costs at a level all the time while getting the same results that we need to maintain safety, you will make all of us over here happy. Anything else you would like to add before we dismiss? Any responses or anything you'd like to say?

Ambassador BROOKS. No.

Mr. RISPOLI. Just in closing, again, Mr. Chairman, thank you for your continued support and we look forward to working with you.

Senator SESSIONS. You have a critical role in our Nation's defense and we look forward to working with you. Thank you. We are adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

1. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, in 1988, Congress established an external oversight board—the Defense Nuclear Facilities Safety Board (DNFSB)—to review the safety aspects of Department of Energy (DOE) defense nuclear activities. In recent experience, however, failure to resolve technical issues raised by the DNFSB has resulted in the need for very costly interruptions in projects while construction was already underway or has required expensive retrofitting or redesign. The most notable examples have been differences over the appropriate seismic standards at the Hanford Waste Treatment Project, as well as the

Salt Waste Processing Facility at Savannah River in South Carolina. There have also been differences of opinion between DOE and the Board regarding the appropriate safety classification for a plutonium facility at Los Alamos National Laboratory (LANL). What is the process, if one exists, for resolving technical issues between DOE and the DNFSB?

Ambassador BROOKS. The DOE guidelines, processes, functions, and responsibilities for interfacing with the DNFSB are delineated in the Department's Manual 140.1-1B, Interfacing with the DNFSB. This is derived from the DNFSB's enabling legislation which specifies the processes for accepting, rejecting, and implementing a DNFSB recommendation. The DNFSB communicates issues with the Department through a variety of mechanisms including formal recommendations, formal reporting requirements, letters requesting action and information, and letters providing information. The Department's process used to resolve a technical issue is based on the DNFSB's mechanism used to communicate it to the Department. In general the action officer develops the strategy and obtains approval from the responsible line manager. The Department's process encourages close communication with the DNFSB and its staff through briefings, discussions, site visits, and other informal interactions.

With respect to safety classification of the ventilation system for the plutonium facility at LANL, National Nuclear Security Administration (NNSA) is conducting specific studies to understand the effectiveness of existing safety systems at LANL and to determine what modifications are needed to improve safety. The NNSA and LANL's approach for addressing the safety classification of the ventilation system and the status of analytical studies have been discussed with the DNFSB.

Mr. RISPOLI. The DOE processes, functions, and responsibilities for interfacing with the DNFSB are delineated in DOE's Manual 140.1-1B, Interfacing with the DNFSB. Usually, matters are resolved at the staff level. Occasionally, issues must be vetted at the executive level to be resolved. Ultimately, the DOE is the arbiter of the safety bases for its facilities.

2. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, is there a process which allows DOE to either accept or reject the DNFSB recommendations prior to the need for these costly interventions?

Ambassador BROOKS. The Department's Manual 140.1-1B, Interfacing with the DNFSB, establishes a process for accepting and rejecting formal DNFSB recommendations. This process is specified in the DNFSB's enabling legislation. The Department's process encourages issues to be resolved early with the DNFSB and its staff through briefings, discussions, site visits, and other informal interactions.

Mr. RISPOLI. Yes, section 315 of the Atomic Energy Act sets forth the process by which the Secretary can either accept or reject a DNFSB recommendation.

3. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, if there were a more formalized process within which the DNFSB could raise concerns, such as at the completion of preliminary design and final design, and then DOE could react to those reviews by the DNFSB—would that be a better system for containing the costs on these projects?

Ambassador BROOKS. The DNFSB's enabling legislation establishes a formal process that requires the DNFSB to review the design of a new defense nuclear facility before construction begins and to recommend to the Secretary, within a reasonable time, such modifications of the design as the DNFSB considers necessary to ensure adequate protection of public health and safety. The legislation also requires that during the construction of any defense nuclear facility, the DNFSB is to periodically review and monitor the construction and submit to the Secretary recommendations relating to the construction of that facility, as the DNFSB considers necessary to ensure adequate protection of public health and safety. The DNFSB and its staff are encouraged to participate in the Department's own review of the design and especially in the development of the preliminary documented safety analysis to avoid having significant changes identified later. The NNSA encourages the DNFSB site representatives to participate in the daily developmental activities, such as meetings to resolve design issues, for the same purpose.

Mr. RISPOLI. The DOE is revising its specific processes for improving how safety is incorporated into design of new nuclear defense facilities, especially in the early project planning phases. As part of that improvement process, the DOE is revising Order 413.3, Project Management for the Acquisition of Capital Assets, originally issued in October 2000. Based on experience and feedback, we have identified a number of potential improvements to clarify and strengthen the order to facilitate early integration of safety in the design, and the continued focus on safety during the construction, testing, and turnover of projects. A public meeting was conducted

on December 7, 2005, where the DNFSB concerns and DOE efforts were discussed. The public meeting focused on the timely incorporation of safety into the design and construction of defense nuclear facilities, and thus DOE is improving its directive in this regard.

HEALTH AND PENSION BENEFITS FOR DOE CONTRACT WORKERS

4. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, in debate on the defense authorization bill last year, there were a number of proposed amendments dealing with the health and pension benefits of DOE contract workers. Most notably, the Senate defeated an amendment which would have enhanced the benefits of contractor employees at the DOE Rocky Flats Site by crediting them with additional service time against the contract. There were other amendments filed to the bill that seemed to be intended to "lock in" the health and pension benefits of contractor employees at other DOE sites. One amendment was structured to prohibit DOE from entering into any contract for work at a DOE site if the contract would have resulted in benefits for contract workers which were less lucrative than those provided to current contract workers. Why does DOE play such an intimate role in the establishment of the benefits packages offered by its contractors?

Ambassador BROOKS. NNSA accomplishes its mission primarily through its contractors and their highly skilled and specialized workforce. Because of the rather unique skills these employees possess they generally work for the NNSA contractor throughout their careers. Even when the government competes its management and operating (M&O) contracts the majority of the employees simply transfer to the new M&O contractor. In this way the government retains the benefit of the skilled workforce and the flexibility afforded by the workers being employees of the contractor rather than the Federal Government. In many instances, the critical skills necessary to accomplish the NNSA mission can be found only in a limited number of places, e.g. the scientists and engineers at our national laboratories.

Virtually all of the costs incurred by the M&O contractor, including the costs associated with pensions and benefits, are reimbursed to the contractor by the government. So, while the NNSA does not treat contractor employees as its own, the long-term relationship and the reimbursement of virtually all costs has led to NNSA working closely with its contractors on the design of the pension and benefits. Contracts typically require approval by the contracting officer of the pension and benefit plan documents, and of any changes to those plans that increase the costs reimbursed by the government.

Mr. RISPOLI. The DOE requires all prime contractors to meet Employee Retirement Income Security Act, U.S. Department of Labor, and U.S. Internal Revenue Service requirements as pension and benefit plan sponsors, while assuring judicious expenditure of public funds. Additional requirements are outlined in the DOE Acquisition Regulation (Code of Federal Regulations, Title 48, Chapter 9) and in the DOE Order 350.1 Chg 1, Contractor Human Resource Management Programs. Because these benefits represent considerable costs to the Department and are reflected in the terms and conditions of our contracts, the DOE provides oversight to ensure appropriate pension and health plans are developed and administered. The DOE does not manage or administer any contractor pension or health plans, nor do we have representatives on any governing boards.

The DOE is committed to fulfilling its obligations under its contracts regarding the reimbursement of contractor employee pension and health benefit costs, but is focusing on methods to mitigate the cost volatility and liability growth and to improve the predictability of the DOE annual cost reimbursement obligations for contractor pension costs.

5. Ambassador Brooks and Secretary Rispoli, is this approach unique, compared with the contracting approaches of other Federal departments?

Ambassador BROOKS. While I believe that the National Aeronautics and Space Administration (NASA) utilizes a similar approach to the management and operation of its facilities, I cannot speak with certainty about the approach other agencies use.

Mr. RISPOLI. The DOE is one of nine agencies that use Federally Funded Research and Development Centers (FFRDCs) to conduct its research and scientific work. According to the Congressional Research Service (CRS), these centers were developed during and after World War II as hybrid organizations to meet a Federal need through the use of private organizations. At that time, there was recognition of a national emergency requirement to recruit and retain scientific and engineering talent for the war effort. DOE's Oak Ridge and LANL were established at that time

as government-owned, contractor-operated (GOCO) facilities, with hiring and employee pension and benefits programs developed and put in place by the contractor operator/employer, not the Federal Government. This system of GOCO facilities, with a contractor workforce, has been used by the DOE since that time to carry out many of the DOE's major mission efforts, including weapons production, scientific research and environmental cleanup.

The DOE is unique among Federal agencies with respect to the extent it utilizes the GOCO approach to accomplishing the agency's missions. However, the Department of Defense (DOD) and other agencies, including the NASA (the Jet Propulsion Laboratory, operated by Caltech), the Federal Aviation Administration, the National Institutes of Health, the Nuclear Regulatory Commission, and Department of Homeland Security also have FFRDCs operated by contractors with contractor employees. In all agencies, Federal contracting officers are responsible for making determinations of allowable human resource management contractor costs, consistent with the Federal Acquisition Regulation and applicable contract terms and conditions.

6. Ambassador Brooks and Secretary Rispoli, can you provide examples of other Federal agencies that have a similar level of involvement in managing workforce issues associated with the employees of its contractors?

Ambassador BROOKS. I do not have detailed insight into other Federal agencies to sufficiently address this question.

Mr. RISPOLI. The DOE and eight other Federal agencies use FFRDCs to conduct scientific research and development work. The DOE has 16 large research laboratories which are FFRDCs. The FFRDCs are operated by contractors (e.g., educational institutions, nonprofit entities, or for-profit entities), with non-Federal workforces and non-Federal pay and benefits systems. In all agencies, Federal contracting officers are responsible for making determinations of allowable human resource management contractor costs, consistent with the Federal Acquisition Regulation and applicable contract terms and conditions.

In response to rapidly increasing costs for employee pension and benefits, most of these FFRDC contractors have restructured their benefits programs. According to the Government Accountability Office (GAO) and the CRS, FFRDCs at other agencies are using defined contribution pension plans (e.g., 401k type plans) and like most employers, do not provide supplemental medical care coverage for those retirees who qualify for Medicare. On April 27, 2006, DOE issued DOE Notice 351.1, Contractor Employee Pension and Medical Benefits Policy that sets forth the DOE's policy on reimbursement of costs for contractor employee benefits. Under this policy, new employees will be offered market-based pension and medical plans.

SECURITY COSTS AND MATERIALS CONSOLIDATION

7. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, a number of committees of Congress, including this one, have urged DOE in the strongest possible terms to move forward on the consolidation of the storage of nuclear materials across the DOE complex. Congress has urged this consolidation in the face of escalating costs to secure these materials against the threats that we now realize exist since the attacks of September 11. What is DOE doing to address the cost of security?

Ambassador BROOKS. The NNSA has been moving aggressively to improve the security of nuclear materials, while continuing our stewardship of the nuclear weapons stockpile. The NNSA has recently completed the relocation of Category I/II nuclear materials from the Criticality Experiments Facility at LANL to more secure facilities within LANL and at the Y-12 National Security Complex and the Nevada Test Site. Current consolidation efforts include eliminating the need for a Category I/II materials at Sandia National Laboratories site in Albuquerque, and construction of new facilities at the Y-12 National Security Complex (Y-12). The new facilities will allow the consolidation of highly enriched uranium into facilities that are easier to protect and more efficient to operate.

To date, over 90 metric tons of surplus highly enriched uranium have been eliminated as part of the fissile materials disposition program. Disposition of additional excess materials is necessary to support the Y-12 onsite consolidation effort, and to support the future de-inventory of Lawrence Livermore National Laboratory. The NNSA is working with other departmental elements to establish disposition paths for materials that are excess to national security requirements. Each of these actions enhances our security posture, reduces security costs, or allows us to avoid unnecessary security upgrades at existing facilities.

Mr. RISPOLI. Consolidation of nuclear materials to fewer sites and disposition of nuclear materials are two strategies that will do the most to reduce the future cost of security. Also, EM continues to evaluate the application of new technologies to reduce the recurring costs associated with manpower intensive operations. Since 2001, EM has consolidated special nuclear materials from 14 material access areas (MAAs) to 3 MAAs, which are facilities that store Category I materials. Additionally, the DOE has established the Nuclear Materials Disposition and Consolidation Coordination Committee (NMDCCC) of which EM is an active member. The purpose of the NMDCCC is to ensure integration of individual program disposition and consolidation efforts thus identifying opportunities for resource sharing.

8. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, specifically, what are you doing within your program to bring about the consolidation of materials and activities which will drive down program costs?

Ambassador BROOKS. The NNSA has taken action to eliminate Category I/II nuclear materials from multiple facilities in the nuclear weapons complex and we are making progress in consolidation and disposition of nuclear materials. However, materials consolidation is a complex issue requiring consideration of site mission requirements, the availability of materials processing, storage, transportation, and disposition capabilities, and negotiation with State governments. The NNSA holds a large inventory of excess nuclear materials. For some of these materials, we have the programs and processes in place to disposition them. Our programs to blend down highly enriched uranium (HEU) have resulted in eliminating over 90 metric tons of HEU.

To continue our progress, additional disposition capabilities are needed. We are constructing facilities at the SRS to convert excess plutonium to nuclear fuel for use in electric power generation. However, there are many materials that cannot be converted to nuclear fuel and until disposition pathways are established, consolidation options are limited. Consolidation to a site without disposition capabilities would be counterproductive, consuming limited packaging, secure transportation, and security resources, but without leading to the elimination of the material. The NNSA is working to establish new disposition and consolidation capabilities, such as the highly enriched uranium facilities at the Y-12 National Security Complex, and plutonium disposition facilities at the SRS. Meanwhile, we are working with other departmental elements to optimize the use of existing disposition capabilities. For example, the NNSA has identified approximately 7.5 tons of nuclear materials that can be processed at SRS, using currently available capabilities.

Mr. RISPOLI. The DOE has established the NMDCCC to address these issues. The Under Secretary for Energy, Science, and Environment, the Administrator of the NNSA, and the Principal Deputy Assistant Secretary for EM comprise the executive steering committee and report to the Deputy Secretary. This committee's initial focus is on establishing a path forward for surplus plutonium at the Hanford Site to avoid significant funding expenditures at Hanford to meet the latest security requirements.

9. Senator SESSIONS. Ambassador Brooks and Secretary Rispoli, the DOE NMDCCC is, as I understand it, the third manifestation of a committee established by DOE to address this issue, under different names and different chairmen, and yet none of these committees have yet issued or implemented any recommendations resulting in actual consolidation of nuclear material between DOE sites. When will we see any results from these efforts?

Ambassador BROOKS. Nuclear material management within the DOE has been very fragmented, with each program setting its own priorities, leaving a legacy of orphaned materials. We recognize the consequences of this stovepipe style of management. Communication among programs has improved significantly, partly as a result of Department-wide consolidation committees. The strategic plan, under development by the NMDCCC, will address the issue of departmental management of nuclear materials. The strategic plan will create a framework for resolving some of the more complex material disposition and consolidation problems faced by the Department. In conjunction with the development of the strategic plan, the NMDCCC is working to develop, in priority order, implementation plans to address specific consolidation/disposition initiatives. The first priority is development of an implementation plan for consolidation of plutonium from the Hanford Site in Washington, and excess plutonium from the national laboratories.

Mr. RISPOLI. The DOE's NMDCCC does have a new chairman with an extensive background in nuclear materials management. This committee is making progress on a variety of issues, and is undertaking to thoroughly evaluate consolidation and disposition issues and thereafter to include recommendations to the Department as

appropriate. Both the NNSA and the Office of EM are active members of the NMDCCC. The principal mission of this committee is to provide a forum to perform cross-cutting nuclear materials disposition and consolidation planning with the objective of developing implementation plans for consolidation and/or disposition as appropriate, so that out-year programmatic and security costs to the Department are minimized.

CONSTRUCTION IRREGULARITIES AT Y-12 IN TENNESSEE

10. Senator SESSIONS. Ambassador Brooks, at its Y-12 Site in Tennessee, DOE is constructing the Highly Enriched Uranium Materials Facility. The principal purpose of this facility is to provide a consolidated location for the receipt and storage of this Nation's stockpile of highly enriched uranium. The new facility will meet all safety and environmental requirements—which current storage locations do not—and will provide a substantially more hardened and secure facility for enriched uranium storage. DOE recently had to halt construction of this facility, however, when it was discovered that the reinforcing steel called for in the approved facility design was not being installed. What is the status of this project?

Ambassador BROOKS. Construction activity is gradually resuming at the Highly Enriched Uranium Materials Facility, with the intention to resume full construction activities by early April depending on the rate at which workers can be recalled or rehired. As of March 7, 2006, about a third of the project's work force had returned to the site to restart steel placements and some non-building structure construction, such as utility accesses and concrete pads that are required for the project but not part of the building itself. The contractor is also putting up structural steel in the mechanical support areas of the building. This setback was indicative of a quality-control problem that required a number of fixes. The contractor has taken aggressive steps to improve the systems, processes, and procedures for project management, quality control/assurance, and line management oversight for this project. In parallel, the NNSA has increased its oversight of the project to ensure that the contractor's assurance systems, processes, and procedures are achieving the necessary changes in the project's performance.

11. Senator SESSIONS. Ambassador Brooks, what is your evaluation of the extent of the problem and what corrective actions are being implemented?

Ambassador BROOKS. Although peer reviews of the technical solutions are not complete, it appears likely that all the non-compliant conditions can be corrected without tearing out the existing construction and starting anew (the large margins in the initial design plus the quality of the conforming work are large contributors to this likely outcome). Normal construction activity will resume during the week of April 3, 2006.

The quality assurance problems have been given personal attention by the senior corporate executives of all contractors and all involved have reviewed and strengthened their oversight systems, processes, and procedures for this project. This includes many changes in personnel including: (1) the replacement of the quality assurance inspector who failed to identify the missing reinforcing steel bars prior to concrete placement, (2) the addition of numerous oversight and quality control/assurance personnel, and (3) the addition and replacement of project and construction management personnel. With respect to the NNSA, the Federal Project Director has assigned a dedicated team of five personnel to oversee all aspects of this project to replace the matrix support he had before these issues surfaced. Numerous changes have been made to reflect the Federal and contractor oversight procedures used at Tritium Extraction Facility (TEF) at the SRS, which have proved to be successful.

12. Senator SESSIONS. Ambassador Brooks, how are the contractor and project managers being held accountable for this interruption in construction activities and any associated costs arising from it?

Ambassador BROOKS. The NNSA has formally notified the Y-12 Site Office of NNSA's intention to reflect this poor performance and the effectiveness of corrective actions in the fiscal year 2006 award fee determination for BWXT Y-12, the management and operating contractor. Implicit in this notification is that we will evaluate BWXT Y-12 in part on the effectiveness of its efforts to hold accountable and to recover costs to the greatest extent possible from the construction subcontractor (with whom the Federal Government has no privity of contract). A multi-year Performance Based Incentive is in place with a primary focus on project baseline cost and schedule performance. Once the upcoming Baseline Change Proposal is submitted and approved the Performance Baseline Incentive will be adjusted accord-

ingly to establish the correct incentive and work to complete the newly established baseline on or before the baseline schedule and within or under the cost baseline. Finally, the contractor has implemented personnel actions including replacing senior project and construction management personnel.

PRICE ANDERSON ACT VIOLATIONS AT LIVERMORE LAB

13. Senator SESSIONS. Ambassador Brooks, last week the DOE issued a notice of violation to LLNL for nuclear safety violations. Specifically, the notice of violation stated that the lab “did not appropriately respond to observed and changing radiological conditions; and radioactive material was allowed to be removed from the site without fully understanding the contamination levels and without the appropriate controls.” The events cited in the notice took place in 2004. Can you explain why the process of issuing this safety citation took so long?

Ambassador BROOKS. The recent LLNL safety citation had a longer timeline than most enforcement actions due to some unique circumstances surrounding the case. Specifically, this enforcement case was extended over time to include an initial key event in August 2004, a second key event in April 2005, and several ongoing and longstanding programmatic compliance issues.

In June 2004, a routine DOE/NNSA Price-Anderson Enforcement Program Review identified that LLNL was not effectively implementing key aspects of its own Price-Anderson self-regulatory program that the Department relies on for applying enforcement discretion. Specifically, if a contractor is effective at identifying and aggressively fixing nuclear safety noncompliances before any real consequences, the Department will typically refrain from issuing a citation.

Following this review DOE/NNSA decided to allow LLNL a 6-month period (June 2004 to January 2005) to improve its self-regulating performance partly due to the limited immediate consequences of the identified issues. A January–February 2005 follow-up review indicated LLNL had made limited progress in addressing the identified issues. In addition, an investigation into an August 2004 radiological event involving a Mobile Waste Characterization Facility (MOVER) indicated that LLNL’s ineffective performance was now resulting in undesirable consequences. In March 2005, DOE/NNSA representatives decided to expand the scope of the MOVER investigation and include other longstanding nuclear safety performance issues. This investigation was completed in August 2005 and included an April 2005 LLNL event involving the unauthorized removal of radioactive contamination from the site.

In late October 2005, an informal enforcement conference was held with LLNL senior management consistent with DOE/NNSA protocols. This informal hearing allows the contractor to comment on the factual accuracy of the investigation, discuss underlying causes and corrective actions, and request mitigation towards any pending citation. A proposed citation was completed in December 2005. In February 2006, the citation was issued under my signature.

14. Senator SESSIONS. Ambassador Brooks, your letter to the Director of Livermore, conveying the notice stated the following:

“I am also disappointed by the longstanding and recurring nature of many of the deficiencies associated with the violations. This recurring aspect casts significant doubt on the Laboratory’s ability to effectively analyze and correct performance problems.”

What measures are you putting in place to address this larger issue?

Ambassador BROOKS. In my letter to the LLNL Director, I conveyed my disappointment in the Laboratory’s track record of failing to correct identified deficiencies in a timely manner. Senior Laboratory managers acknowledged the need for significant improvements in the Laboratory’s safety culture. We are committed to addressing identified concerns and have been working aggressively over the past year on corrective actions to prevent reoccurrence and ensure that high-quality safety programs are in place at LLNL.

Our actions to date have included:

- A thorough causal analysis of both the MOVER and Phosphorous spill events has determined the underlying root causes resulting in the implementation of new radiation protection procedures, employee training, incident response communication, and quality assurance processes.
- Strengthening senior Laboratory management accountability and instituting safety contracts with senior managers to hold individuals personally accountable. These contracts, required by the Director of the Laboratory, stipulate that senior managers personally certify safety practices within their organizations. This includes conducting senior management walk-

downs and detailed physical reviews of Laboratory-wide hazard activities. Laboratory managers are working to develop and implement a culture that encourages all employees to stop work at any time if safety could possibly be compromised.

- Instituted a new Laboratory Office of Institutional Performance Analysis (OIPA) that now tracks all external assessments and required closeout dates. OIPA also analyzes performance data to identify potential issues and applies a “lessons learned” strategy systemically across the laboratory. A new senior management council regularly reviews the work of OIPA, providing additional quality assurance. The Lab’s internal Price-Anderson Amendments Act (PAAA) office structure and program expectations have been aggressively strengthened. PAAA personnel have implemented new causal analysis, verification, and validation procedures.

- Specific improvements in other areas such as configuration management, the formality of operations within our nuclear facilities, incident response and safety procedures, and radiation protection program staffing to enhance and strengthen nuclear safety at LLNL.

- From the DOE and NNSA perspective, I have increased the level of Federal oversight at the Livermore Site Office, assisted by nuclear safety experts from the NNSA Chief of Defense Nuclear Safety Office, to monitor and assess LLNL implementation of nuclear safety requirements. I will evaluate Laboratory performance in complying with nuclear safety requirements and the effectiveness of corrective actions as part of the annual contractor performance review.

TEST READINESS

15. Senator SESSIONS. Ambassador Brooks, the National Defense Authorization Act for Fiscal Year 2004 requires DOE to achieve a level of “test readiness” which would allow the resumption of underground nuclear testing within 18 months of a Presidential decision to conduct a test. Under the law, DOE is to achieve this level of readiness no later than October 1, 2006. I understand, however, that Congress has not appropriated sufficient funds to allow the NNSA to support this deadline. Is it true that DOE forecasts it cannot meet the statutory deadline?

Ambassador BROOKS. While the NNSA has made considerable progress in improving its test readiness posture over the last 4 years, reducing the readiness time from 36 months to 24, Congress did not provide the funding requested by the President to achieve an 18-month test readiness posture by the end of fiscal year 2006, as required by section 3113 of the National Defense Authorization Act for Fiscal Year 2004. Therefore, test readiness posture at October 1, 2006, will be about 24 months.

16. Senator SESSIONS. Ambassador Brooks, in your view, does a readiness posture of 24 months represent an acceptable level of technical risk?

Ambassador BROOKS. Yes, we believe that this significant improvement to 24 months is adequate for meeting our national security needs.

17. Senator SESSIONS. Ambassador Brooks, in other words, since a problem would likely have to be severe for this country to debate a return to nuclear testing, when faced with a serious problem such as this, in your technical judgment is it prudent to have to wait 2 additional years until we are ready to conduct a test to diagnose the problem?

Ambassador BROOKS. As previously discussed, Congress did not fully provide the funds requested by the President to achieve an 18-month test readiness posture by the end of fiscal year 2006. However, we do believe that 24 months is adequate for meeting our national security needs.

RELIABLE REPLACEMENT WARHEAD

18. Senator SESSIONS. Ambassador Brooks, at the direction of Congress, DOE is currently conducting a joint feasibility study—with the DOD—on a RRW. This study will analyze a technical approach to warhead design and maintenance which could potentially eliminate many of the most costly and hazardous materials which are used in the current nuclear stockpile. The nuclear weapons experts at the national laboratories appear to be confident that it will be possible to field a RRW without needing to resume underground nuclear weapons testing. Do you share their confidence and why?

Ambassador BROOKS. Yes, I do share the confidence of those who believe that we will be able to field a RRW without needing to resume underground nuclear testing. While I am not a nuclear weapon designer, I trust the judgment of expert nuclear weapon designers who inform me that it is possible to field a warhead without underground testing, especially if that warhead has ties to a previously tested configuration. The intent of the RRW program is to identify nuclear and non-nuclear replacement components that could be fielded without nuclear testing. Feasible RRW options will be based on our database of historical nuclear tests as well as from the experience of the remaining designers and engineers who have successfully fielded our current stockpile. The advances of our Stockpile Stewardship Program (SSP) enable us to better understand nuclear explosive performance through modeling, simulation, and experiments. The RRW designs are explicitly chosen for higher margin in primary performance so that certification analysis based on quantification of margins and uncertainties will provide greater confidence than that provided by today's high yield-to-weight designs as they continue to age or are modified as part of the refurbishment program. That combination of historical test information, modern SSP tools (e.g., high energy density physics and the Advanced Simulation & Computing program), improved margins, experienced designers and engineers, along with relaxed military requirements for yield-to-weight ratios, will enable us to design and certify nuclear components with high confidence. As a result, fielding RRW systems will likely reduce the possibility that the U.S. will need to conduct a nuclear test for certification or to diagnose or remedy a stockpile reliability problem.

PIT PRODUCTION AND PLUTONIUM AGING

19. Senator SESSIONS. Ambassador Brooks, the United States ceased production of plutonium pits when Rocky Flats was closed in 1989 and is now trying to reconstitute a modest production line for pits at LANL. What challenges—technical, operational, or cultural—is DOE encountering in trying to increase the rate of production of pits at Los Alamos?

Ambassador BROOKS. There are many challenges confronting the DOE and the LANL in increasing the rate of production of pits at the plutonium facility at TA-55/PF-4. The PF-4 facility was designed over 30 years ago to support plutonium research and development instead of the current multiple missions that include pit production. Major challenges to improve the pit production capacity of PF-4 include the physical limitations of the facility, equipment configuration and installation, personnel qualification and retention, and continued support of multiple plutonium missions. The TA-55/PF-4 facility supports a number of important national missions in addition to pit production. For example, continuing Pu-238 missions supporting the NASA, both conventional and enhanced surveillance activities for pits, special recovery activities, non-proliferation activities, and small-scale physics testing. All of these activities use TA-55/PF-4 space that limits the ability to expand the pit manufacturing mission. The NNSA and LANL are working to resolve these challenges, and are committed to establishing a pit production capacity of 10 W88 pits per year in fiscal year 2007.

20. Senator SESSIONS. Ambassador Brooks, will the production at Los Alamos be sufficient to sustain the stockpile over the long-term?

Ambassador BROOKS. The NNSA plans to increase the LANL pit manufacturing capacity to 30–40 pits per year by the end of fiscal year 2012. This production rate, however, is insufficient to meet DOD projected requirements. The NNSA submitted a report to Congress in January 2005 that identified the need for at least a 125-pit per year capacity starting in 2021. This is based on a 60-year pit lifetime and a stockpile based on the planned 2012 stockpile size approved by the President and provided to Congress in a June 2004 report. Although we expect more refined pit lifetime estimates by the end of fiscal year 2006, future pit production capacity requirements are likely to be driven more by stockpile transformation than legacy pit lifetimes. We are currently working with the DOD to develop long-term stockpile quantities and transformation rates that would provide the requirement basis for a long-term pit production capacity. Once we validate those requirements through the Nuclear Weapons Council, we will work with Congress to establish a plan for an infrastructure that can support the longer-term need for pits.

21. Senator SESSIONS. Ambassador Brooks, in 2005, Congress directed DOE to initiate more detailed study of the aging of plutonium pits used in nuclear weapons to determine how long we might expect the current pits to last. What is the status of this investigation?

Ambassador BROOKS. By the end of fiscal year 2006, we will have system-specific pit lifetime estimates that have been subject to peer review between the weapons physics laboratories (LLNL and LANL) and external review by a panel of scientific experts known as JASON.

SETTING BUDGET PRIORITIES

22. Senator SESSIONS. Secretary Rispoli, I am concerned that DOE spending plans are influenced by the most vocal outside groups, or by compliance agreements made years ago, and not through a careful analysis of what environmental situations pose the greatest risk, and how much cleanup is needed at each site in relation to the future use of the site. Under the current program, is the DOE focused on cleaning up the worst problems?

Mr. RISPOLI. The fiscal year 2007 budget request reflects a crucial balance of reducing risk and completing cleanup—an integrated strategy to meet the program's objectives. Overall, our request puts a high priority on safely dealing with tank waste, special nuclear materials, and spent nuclear fuel disposition—our highest risk materials—while preserving our commitments to site completion and closure.

23. Senator SESSIONS. Secretary Rispoli, is the DOE cleanup budget prioritized by risk or are budgets set by the deadlines in the cleanup agreements?

Mr. RISPOLI. In formulating the budget request, we prioritize cleanup work based on a judicious integration of risk, statutory and regulatory requirements (including cleanup agreements), interdependencies with communities and other DOE locations, and contract and workforce efficiencies. Our aim is to forecast the needs of the program in meeting the mission objectives of risk reduction and cleanup completion while being good stewards of the U.S. taxpayer's funds.

24. Senator SESSIONS. Secretary Rispoli, the cleanup agreement between DOE, the EPA, and Washington State—called the Tri-Party Agreement—was originally signed in 1989. A panel of outside experts reviewing the Hanford cleanup characterized this agreement as follows: “the milestones (in the agreement) were established well before all the underlying science and technology had been developed.” In addition, according to reports, Under Secretary of Energy David Garman made the following statement in a speech on February 16, 2006:

“Let's just be honest here; we're going to be in the legacy cleanup business for a while. I think it's important for us to get honest about that. To get honest about what our capabilities are. To be honest about what kinds of timeframes we're looking at.”

In your view, does it make sense to review the regulatory agreements in place governing these cleanups—either on a periodic basis or in cases where substantial new data or science is now available?

Mr. RISPOLI. The Hanford TPA Action Plan contains a process and a form by which changes can be made to the TPA as the Hanford cleanup progresses. Processes for changes to milestones are contained in all of our regulatory agreements. The DOE and its regulators continuously review these agreements for needed changes to milestones that may result from technological advances and other issues.

Under the terms of the Hanford TPA, there have been approximately 440 approved change requests, six amendments, and three modifications known as “Directors Determinations.” Within these changes, the parties have agreed to add approximately 860 new milestones, delete approximately 160 milestones, and extend approximately 200 milestones. Essentially, these agreements in particular (and others in general) are revised as situations warrant.

25. Senator SESSIONS. Secretary Rispoli, if the drive to execute these cleanups on their original schedules is causing a substantial upward pressure on the cost of cleanup, does DOE have an obligation to revisit the existing commitments?

Mr. RISPOLI. We are obligated to look at any opportunity that would provide a similar or increased level of cleanup and risk reduction at an improved schedule or lower cost to the U.S. public. We invite input from our cleanup partners and other stakeholders that would enhance the cost-effective completion of our mission objectives while meeting their expectations.

WASTE INCIDENTAL TO REPROCESSING

26. Senator SESSIONS. Secretary Rispoli, 2 years ago, Congress conducted substantial debate on the issue of residues or "heels" left in nuclear waste storage tanks. Congress ultimately granted DOE the authority to leave some small amount of this residue in place, after DOE had physically emptied as much nuclear waste from each tank as possible. This waste was defined as "waste incidental to reprocessing." How has DOE used this new authority?

Mr. RISPOLI. The DOE is implementing Section 3116 of the Ronald W. Reagan National Defense Authorization Act (NDAA) for Fiscal Year 2005 at the SRS and the Idaho National Laboratory (INL), the two sites covered by the legislation.

On January 17, 2006, the Secretary made the first waste determination under section 3116 for salt waste disposal at SRS, after an approximately 10-month long consultation with the NRC. DOE is now pursuing the necessary permits from the State of South Carolina.

DOE is currently consulting with the NRC on two other waste determinations involving stabilized residual waste. The first concerns INL tank residual waste, tanks, and associated components. The second concerns residual waste in tanks at SRS.

27. Senator SESSIONS. Secretary Rispoli, the new authority requires DOE to consult with the NRC in these matters. Has the NRC found this approach to tank cleanup to be protective of public health?

Mr. RISPOLI. In late December 2005, the NRC issued a Technical Evaluation Report (TER) for the DOE draft waste determination for salt waste disposal at the SRS. This NRC assessment was limited to the salt waste disposal determination prepared by DOE. The NRC concluded that there is reasonable assurance that DOE can meet the criteria provided in the Ronald W. Reagan NDAA for Fiscal Year 2005 in section 3116 (a)(1), (a)(2), and (a)(3)(A)(i), provided that certain assumptions made in DOE's analyses are verified via monitoring. The NRC reached this conclusion based on information provided by DOE to the NRC in letters dated March 31, June 30, September 15, and September 30, 2005.

There are three applicable criteria for determining that certain wastes from reprocessing are not high-level waste. NRC's position on each criterion follows:

- "Given that there is reasonable assurance that DOE's proposed approach can meet the other criteria in the NDAA, including the performance objectives of 10 Code of Federal Regulations (CFR) 61, Subpart C [Licensing Requirements for Land Disposal of Radioactive Waste], and that there appears to be no other properties of the waste that would require deep geologic disposal, the NRC finds that there is reasonable assurance that Criterion One [that the waste does not require permanent isolation in a deep geologic repository for spent fuel or high-level radioactive waste] of the NDAA can be met."
- "[T]he NRC has concluded that there is reasonable assurance that DOE can meet Criterion Two [that the waste has had highly radioactive radionuclides removed to the maximum extent practical] with its proposed approach."
- "[T]he NRC has concluded that there is reasonable assurance that DOE can meet Criterion Three, which by reference incorporates the performance objectives of 10 CFR 61, Subpart C."

The NRC's conclusions presented in the TER are based on the information provided by DOE. The NRC asserted, "If, in the future, DOE determines it is necessary to revise its assumptions, analysis, design or waste management approach and those changes are important to meeting the criteria of the NDAA, DOE should consult once again with the NRC regarding the enclosed TER."

28. Senator SESSIONS. Secretary Rispoli, this authority does not apply to the waste tanks at Hanford in Washington. Is there something unique about the chemistry of the waste in those tanks or could the extension of this authority to Hanford tank waste result in an improved and more cost effective cleanup for the Hanford tanks?

Mr. RISPOLI. While different reprocessing technologies and unique radionuclide removal programs were employed at Hanford, the SRS, and the INL, the chemical make-up of the waste does not preclude extension of this authority to Hanford tank waste. In fact, with the exception of the final waste form for some of the wastes, the strategy for retrieval, treatment, and disposal of tank wastes at the Hanford Site is consistent with that of the SRS.

BUDGET PROPOSAL TO HIRE A PROJECT MANAGEMENT AGENT AT HANFORD

29. Senator SESSIONS. Secretary Rispoli, the fiscal year 2007 budget request includes a proposal to hire a contractor—referred to as a “project management agent”—to oversee or manage the work that is being done by another contractor (Bechtel) at the Hanford Waste Treatment Plant (WTP). This reads like an unusual proposal to hire one government contractor to manage another government contractor. Could you please explain the proposal that is contained in the budget request for the hiring of this new “project management agent” at Hanford?

Mr. RISPOLI. The project management agent would be what is termed in the commercial construction industry as the owner’s representative, with the DOE being the owner. During peak construction and commissioning of the WTP, this agent will have up to five full-time senior personnel, each with expertise in managing large projects of similar complexity. The agent will serve in an advisory role to the DOE and will not direct Bechtel National, Inc., the Hanford WTP contractor. The agent would advise DOE on: design conformance with contract requirements; cost containment, quality assurance, and safety compliance; effectiveness of management processes such as change control and invoice reviews; and contingency issue anticipation. The goal is for the agent to provide a broad range of experience and advice to the DOE’s Federal Project Director overseeing the WTP project.

This type of service is common in the engineering and construction industry, and DOE has successfully employed this type of service on several past projects.

30. Senator SESSIONS. Secretary Rispoli, what is Congress being asked to fund and, if funded, what organizational structure would result?

Mr. RISPOLI. The DOE’s fiscal year 2007 budget request for the major construction of the WTP, Subproject 01-D-416, includes proposed funding to obtain project management oversight assistance and personnel to serve in an advisory role to the DOE’s Federal Project Director for the WTP project. The Federal Project Director reports to the Manager, Office of River Protection. The goal is for the advisor(s) to provide a broad range of experience and advice to the Federal Project Director and to the Headquarters office dedicated to oversight of this project, to help assure successful completion of the WTP.

31. Senator SESSIONS. Secretary Rispoli, DOE is also requesting funds to hire additional Federal staff to manage the WTP project. Will the Federal staff then oversee both contractors?

Mr. RISPOLI. The DOE Federal Project Director and other senior Federal staff will oversee both the WTP contractor, Bechtel National Inc., and the project management agent.

32. Senator SESSIONS. Secretary Rispoli, DOE has now put in place a number of review teams and senior management teams, as part of the “recovery” plan at the WTP. Could you please provide a diagram or narrative explaining the current reporting and organizational structure in place for this project?

Mr. RISPOLI. The DOE’s accountability for the Hanford Waste Treatment and Immobilization Plant project flows from the Deputy Secretary, as the Secretarial Acquisition Executive, to the Assistant Secretary for EM, to the Chief Operating Officer for EM, to the Manager, Office of River Protection, to the Federal Project Director. The Office of Project Recovery serves in an oversight and advocacy role at the Headquarters’ Office of EM. The Director for the Office of Project Recovery reports directly to the Assistant Secretary for EM.

REEXAMINATION OF RESPONSES

33. Senator SESSIONS. Secretary Rispoli, in your invitation to appear, you were asked to address, as a component of your testimony, a number of policies and issues confronting the EM program which you were not able to address during your confirmation last year, but which you had committed to address upon assuming your duties as Assistant Secretary. Since you did not provide those views as part of your testimony for the hearing, I am renewing the subcommittee’s request for this information by resubmitting these questions, originally asked of you during your confirmation proceedings. Please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: The Assistant Secretary for EM is responsible for cleanup activities occurring at DOE sites across the country. What are your views on the roles and responsibilities of field managers relative to those of EM headquarters managers?

Mr. RISPOLI. The field managers are responsible for ensuring that the cleanup work is done in a safe and effective manner, and in compliance with applicable laws and regulations. They are responsible for managing the projects imbedded in the contracts through which the Office of EM accomplishes its work. Headquarters managers are responsible for developing policy and providing guidance that affects field operations. Headquarters managers also provide oversight of the field activities to ensure the work is carried out consistent with DOE and EM policies.

34. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: What is your view of EM's organizational structure?

Mr. RISPOLI. The Office of EM is currently in the process of modifying its headquarters organizational structure to place greater emphasis on acquisition and project management, safety, and technical expertise. Our primary goal is to manage our projectized portfolio with 90 percent of our projects performing on, or better than, cost and schedule targets. We must do this safely, for the protection of the workers, the site, and the communities where our sites are located. The proposed organizational structure better supports these goals by establishing clear lines of responsibility and accountability to improve overall program performance.

35. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Is there a well-delineated and consistent chain of command and reporting structure from the field staff to headquarters staff, from the contractors to DOE officials, and from the Office of EM to the Secretary of Energy and other DOE officials?

Mr. RISPOLI. The Office of EM is in the process of modifying its headquarters structure to improve program performance. One method of accomplishing this is to establish clear lines of responsibility and accountability at the most appropriate level within programs and projects. Our proposed organizational structure solidifies roles and responsibilities of each office in EM. Clearly understood roles and responsibilities will improve interaction between field and headquarters staff, and between Federal and contractor personnel. Unchanged will be the line chain of command, which is exercised by the Chief Operating Officer at Headquarters, directly to each EM site manager. I intend to ensure all staff know their decisionmaking authority and understand the chain of command for elevating issues when necessary.

36. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Do the field offices have enough autonomy and flexibility to work with the contractors at the sites to get the cleanup finished in a safe and efficient manner? In your opinion, should the field offices have more autonomy than they currently have?

Mr. RISPOLI. I believe sufficient autonomy and flexibility exist within field offices to enable Federal staff to work with site contractors effectively in completing clean-up activities in an efficient manner. We are focusing on improving the understanding that field office staff and headquarters staff have of their roles and responsibilities within this process to maximize the effective use of their capabilities. The entire focus is based upon the fundamental principle that headquarters staff exist to assist the Chief Operating Officer and the line organization to get the job done safely and effectively.

37. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: The EM program has used a variety of contracting methods, including management and operating cost plus award fee contracts, cost plus incentive fee contracts, and performance-based, fix-priced contracts. What is your view of the role of these, or other, contracting methods, and what principles do you believe DOE should follow when entering into EM contracts in the future?

Mr. RISPOLI. As I stated to the Senate Armed Services Committee in June 2005, there should be a common, disciplined approach to our acquisitions and contract management for the Department's EM projects. This approach should offer the necessary latitude for tailoring each contract to suit the individual challenges and risks associated with each situation.

Since most of EM's cleanup activities are accomplished through the use of a contract workforce, our acquisition strategies, contract usage, and contract management

are of paramount importance. That is why EM's headquarters reorganized structure includes a Deputy Assistant Secretary for Acquisition and Project Management, whose function will be to lead development of acquisition strategies and contract vehicles that set clear responsibilities, specific tasks, and facilitate improved contract management by commercial contractors as well as by Federal onsite officials.

When entering into contracts in the future, I expect the type of contract to be selected on a case-by-case basis considering the scope and complexity of the work, the uncertainties and risks involved, the period of performance, and the incentive arrangement. This includes appropriate use of management and operations arrangements, cost-plus-incentive-fee contracts, performance-based contracts, and fixed-price contracts for projects with well-defined work scope.

I expect to continue aggressive contracting strategies to clean up and close sites that have clearly defined scopes of work and end states. The goal is to write solicitations that incentivize safety, innovation, cost savings, and schedule acceleration, where appropriate, and to complement our emphasis on a strengthened project management program.

38. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: The DOE has offered changing views, over the lifetime of the EM program, as to whether the program should focus on cleaning up the sites now within its purview or whether the program should have an ongoing mission of cleaning up all surplus DOE facilities, as the facilities become excess, over time. Do you believe there is a point at which the EM program should stop taking surplus buildings, facilities, or waste streams from other components of the DOE into the EM program for decommissioning, decontamination, and disposal?

Mr. RISPOLI. The DOE recognizes that it has significant environmental liabilities that are not currently the responsibility of any program. The DOE is currently in the process of evaluating options for handling these unassigned and unfunded environmental liabilities.

39. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: What requirements would you place on the other DOE programs before you would take additional buildings, facilities, or waste into the EM program?

Mr. RISPOLI. The DOE is currently in the process of evaluating options for handling unassigned and unfunded environmental liabilities and expects to identify a path forward by the end of fiscal year 2006. As part of the transfer of any facility from one program to another program for decontamination and decommissioning, I would envision that the transferring program would be required to stabilize that facility so that any immediate risk would be mitigated. A complete set of transfer requirements will be developed as part of the process of resolving this issue.

40. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Do you believe it is an appropriate policy for the EM program to "go out of business" at some point and leave the remainder of newly generated waste as the responsibility of existing DOE programs? If not, how should newly generated wastes be managed and which program (EM or the program generating the waste) should budget for these activities?

Mr. RISPOLI. Yes, I believe it is the appropriate policy that the DOE program that generates the waste is responsible for its management and disposal. This is standard industry practice, since it provides an internal driver for the generator to develop a cost-effective waste management program that incorporates waste minimization approaches. As a result, over the last several years, responsibility for management of newly generated waste has been transferred to the generator or landlord program at the various sites. The Office of EM maintains responsibility for the management of newly generated waste at sites where it is the landlord program.

41. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: In developing the National Defense Authorization Act for Fiscal Year 2006, this committee did not adopt the proposal in the President's budget request of transferring certain EM activities from the EM program into the NNSA. In the committee's view, such a transfer would not comply with the legislation which established the NNSA. What is the DOE's interpretation

of these provisions of the NNSA Act which relate to the possible transfer of cleanup activities into the NNSA? What is your interpretation?

Mr. RISPOLI. Title XXXII of the National Defense Authorization Act for Fiscal Year 2000 (Public Law 106–65 as amended, the “Act”) established the NNSA as a separately organized agency within the DOE. The Act provides that the Under Secretary for Nuclear Security serves as the Administrator of NNSA. The Secretary of Energy may transfer to NNSA “any . . . mission or function that the Secretary, in consultation with the Administrator and Congress, determines to be consistent with the mission of the [NNSA].” (NNSA Act § 3291(b)). (Section 3291(c) of the Act allows, but does not require, the Secretary to “transfer responsibility for” any environmental remediation or waste management activity to another non NNSA element of the DOE.) Furthermore, the Act provides that the Administrator shall ensure that the NNSA complies with all applicable environmental statutes and requirements, and requires that the operations and activities of NNSA are carried out in a manner that protects public health, safety, and the environment. (NNSA Act §§ 3261, 3211). In light of the Secretary’s authority to transfer functions to NNSA that are consistent with NNSA’s mission and the Administrator’s responsibility for ensuring that NNSA complies with environmental requirements and protects the environment, the DOE’s interpretation is that the NNSA Act allows the Secretary to transfer these functions to NNSA after consulting with the Administrator and Congress, and that the Administrator would have the authority and responsibility for carrying them out. My interpretation is the same as the DOE’s.

42. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: During her confirmation hearing before this committee on June 7, 2001, Ms. Jessie Hill Roberson, your predecessor in this position, testified that it was her goal to “make changes that have lasting and permanent impact on this program.” Do you believe that the EM program is best served, at this point in time, by a continuation of the focus on accelerated cleanup begun under Assistant Secretary Roberson?

Mr. RISPOLI. Yes. As has been demonstrated in the past, EM’s cleanup philosophy has proven to deliver results. Cleanup at as many as nine sites will be completed by the end of 2006, including Rocky Flats, Fernald, Miamisburg, Columbus, Ash-tabula, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory—Main Site, Sandia National Laboratories, and Kansas City Plant. In addition to these important site completions, EM has completed many of the activities focused on addressing the highest risks in tank waste management and nuclear material stabilization. EM will continue to maintain a focus on completion of site cleanup, which eliminates so-called “hotel costs” in order to optimize cost savings, with an additional eight sites or areas (Argonne National Laboratory—East, Brookhaven National Laboratory, East Tennessee Technology Park at Oak Ridge, Energy Technology Engineering Center, Lawrence Livermore National Laboratory—Site 300, Inhalation Toxicology Laboratory, Pantex Plant, and the Stanford Linear Accelerator Center) projected to be completed in the 2007 to 2009 timeframe.

43. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: One of the initiatives undertaken by Assistant Secretary Roberson was the development of end states documents for each major site in the EM program, depicting the residual contamination levels remaining at each site after the completion of cleanup. What is the status of the development of end states for each major site?

Mr. RISPOLI. End state vision documents have been developed for almost all of the major sites. The Hanford end state document is nearing completion, and all other major sites have completed their final draft end state documentation. Some sites have been exempt from the process because the sites are scheduled to close in 2006 or 2007. Each end state document takes into account residual contamination levels and the appropriate alternatives for remediation. The process of evaluating and refining end states will continue as new information becomes available, new remediation technologies are developed, and alternatives for future land use emerge. These documents will be used to inform the applicable regulatory processes in determining ultimate cleanup goals and associated remediation activities.

44. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Were these documents intended to receive

the concurrence of State and Federal environmental regulators at each site, and if so, which sites received such concurrence?

Mr. RISPOLI. The end state documents reflect consultation among DOE and State and Federal environmental regulators. They were formulated in cooperation with the regulators and in consultation with affected governments, including Tribal nations, as well as stakeholders. The existing regulatory process, i.e., the Comprehensive Environmental Response, Compensation, and Liability Act, is the appropriate vehicle to provide for such consultation. The purpose of the consultative and iterative processes is to provide that the final end state vision for each site will have consultation with all affected parties.

45. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: What is the status of these documents at sites which did not receive concurrence?

Mr. RISPOLI. No sites have received concurrence on their end states vision documents. The end state documents are intended to reflect a consultation among DOE, and State and Federal environmental regulators. DOE continues to work with the regulators to develop end states that are protective, sustainable, and appropriate for the future use of the site and surrounding areas.

46. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Did the EM program intend for the end states documents to be the starting point of a discussion with regulators about changes to the existing regulations and compliance agreements that guide cleanup? If so, would you pursue such discussions with regulators?

Mr. RISPOLI. The end state documents are intended to be the product of a consultative process involving regulators and stakeholders that uses risk-informed decision-making to ensure that sites are remediated to a level that is protective, sustainable, and appropriate for the future use of the site and surrounding areas. The development of these documents is one way in which the DOE continues to work with its regulators and stakeholders to achieve the best, mutually beneficial cleanup. The DOE has cleanup agreements in place at most of its sites; these agreements were developed in accordance with laws governing cleanup, such as the Comprehensive Environmental Response, Compensation, and Liability Act, the Resource Conservation and Recovery Act, and the Atomic Energy Act. DOE, in cooperation with the regulators and stakeholders, may consider revising existing cleanup agreements if the parties agree that such changes substantially improve the effectiveness of the cleanup.

47. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: One of the promises of accelerated cleanup was that by applying additional funds in the near-term to achieve the early completion of cleanup at certain sites, more funds would be available for the remaining sites where cleanup is expected to take longer. In other words, if DOE got a few sites done and out of the way, there would be more room in the budget to tackle other sites. Do you believe this promise of accelerated cleanup has yet been realized, and if not, why not?

Mr. RISPOLI. The DOE has achieved several successes in its accelerated cleanup efforts, including the physical cleanup of the Rocky Flats Site along with up to eight additional sites planned for completion in 2006 and as many as another nine sites by 2009. There remains a strong focus on cleanup and closure.

48. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Do you believe that the EM program has conducted sufficient technology development so that a treatment and disposition pathway exists for all identified waste streams under the program?

Mr. RISPOLI. The Office of EM conducts selected technology development and deployment activities to support the treatment and disposition pathways for most of the identified waste streams under the program. EM will continue developing new or improved technologies that address limitations in current characterization and treatment capabilities. Further, because of the long time frame associated with cleaning up and closing the sites, EM will be conducting technology development activities well into the future, including those for wastes currently without disposition pathways. The technology development focus is on treating and disposing of high-

level tank wastes, stored transuranic waste, deactivation and decommissioning, and groundwater and soils.

49. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: If any orphan waste streams—those for which there is no identified disposition pathway—exist within the EM program, what technology development or other efforts would you undertake to address them?

Mr. RISPOLI. To directly support the Office of EM's accelerated cleanup, the EM Technology Development and Deployment (TD&D) Program is aligned and driven by site cleanup priorities. The technology development focus is on treating and disposing of high-level tank wastes, stored transuranic waste, deactivation and decommissioning, and groundwater and soils. The field sites and headquarters staff identify, select, and fund higher-risk, higher-cost technology alternative projects that are outside of a site's prime contract and/or baseline scope/schedule. If an orphan waste stream(s) project meets the selection criteria, then one or more alternative project(s) would be funded to resolve it. But, since orphan streams are those of unique or unusual compositions, and tend to be site-specific and of limited quantities, they might not meet the criteria for funding through the mechanism of TD&D alternative projects. Instead, technology development projects to address the orphan waste streams, when identified and requested by the sites, are then addressed on a case-by-case basis, and if approved, are funded through the Technical Assistance Program. This includes two closely related programs: quick-response technical consulting (Technical Expertise) and short-duration technology projects (Technical Solutions Projects). As designed, the direct assistance is provided by EM Headquarters to develop lower-cost, lower-risk technical improvements to accelerate closure of the sites. I believe it is essential for our complex cleanups to have a TD&D program. This is an essential component of our ability to address limitations, for example, in current radioactive waste characterization and treatment capabilities.

50. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: What, in your view, are the continuing requirements for developing and fielding new technologies, and what are the highest priorities?

Mr. RISPOLI. The Office of EM program's technology investment strategy is linked specifically to site Performance Management Plans and life-cycle baselines, site end states, and corporate performance measures. The strategy is based upon eliminating technology gaps or deficiencies in capabilities, reducing technological risk in current site baselines, improving performance, and lowering costs of current operations. Technology investments are selected using criteria focused on integrating the resulting product with site operations to ensure the greatest impact to the EM mission in terms of risk and cost reductions. The technology development focus is on treating and disposing of high-level tank wastes, stored transuranic waste, deactivation and decommissioning, and groundwater and soils.

51. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: During fiscal year 2006, the EM program is scheduled to complete cleanup at the following closure sites: Rocky Flats, Mound, and Fernald. In each case, DOE must decide how to administer or transfer the post-closure pension and medical benefits for cleanup workers at these sites. DOE has indicated that it intends to keep the responsibility for administering these benefits with the cleanup contractors, post-closure. Has DOE evaluated any cost efficiencies that would be gained by pooling the sponsorship and functional management of post-closure benefits into a single purpose contract; one that could be competed for and awarded to one of a number of companies that specialize in the administration of such benefits?

Mr. RISPOLI. Physical work was completed at the Rocky Flats site last October. Sponsorship and management and administration for the pension and welfare benefit plans for retirees are in the process of being transferred from the Rocky Flats contractor, Kaiser-Hill Company, L.L.C (K-H) to a K-H corporate affiliate, CH2M Hill Hanford Group, Inc. Work at the Mound site is due to be completed in September 2006 and at Fernald in September 2006 or sooner. Prior to that time, the Department will determine what direction to provide to the contractors regarding the disposition of the pension and retiree benefit plans at those sites.

In instances where a site is closed without a successor contractor, in the near-term, DOE intends to budget sufficient funds to settle pension plan obligations at

the earliest practicable date. DOE is analyzing alternative vehicles to provide long-term contractor retiree medical benefits.

DOE has not evaluated the costs of pooling the sponsorship and functional management of post-closure pension benefits into a single contract. The Department has not pursued this because the pension benefit plans still will require appropriate legal sponsors. The Department neither can legally sponsor qualified pension plans for private sector employees nor assign sponsorship authority it does not have to an entity that has no corporate relationship to contractor employees.

52. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Assuming the EM program is funded at the level of the fiscal year 2006 budget request, will there be any sites under the EM program where sufficient funding will not be available to make payments to employee pension plans at the levels mandated under the Employee Retirement Income Security Act (ERISA)?

Mr. RISPOLI. The Office of EM's fiscal year 2006 budget request and subsequent fiscal year 2006 congressional appropriations provide sufficient funding to make payments to employee pension plans at the levels mandated under the ERISA.

53. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Are you aware of any sites under the EM program where making ERISA-mandated pension plan payments will result in such a drain on available funding that the furlough or involuntary separation of employees at the site will be necessary?

Mr. RISPOLI. The Office of EM's fiscal year 2006 budget request and subsequent fiscal year 2006 congressional appropriations provide sufficient funding to make payments to employee pension plans at the levels mandated under the ERISA without work force impacts.

54. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Your duties will involve the review and approval of workforce restructuring plans at sites under the EM program. Please describe your general approach and philosophy in reviewing workforce restructuring plans. Given the nature of their work, cleanup workers are fundamentally in a position of "working themselves out of a job." How do you believe this particular challenge is best handled from both a corporate perspective and as a manager of these workers?

Mr. RISPOLI. The Office of EM reviews workforce restructuring plans to ensure that activities are conducted in accordance with DOE policies and directives. EM's objective is to ensure that the contractor's strategy effectively accomplishes the site's mission by retaining employees with the skills, knowledge, and abilities necessary to effectively and safely meet current and future missions within budget. As a result of cleanup progress and the subsequent reprioritization of work scope, workforce restructurings will continue, as we strive to use skills efficiently and in a way that minimizes involuntary separations. Individuals involuntarily separated from positions performing cleanup work for DOE contractors may qualify for preferences in hiring at DOE facilities and additional recall or bumping rights under applicable collective bargaining agreements.

55. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: The Federal Government and the State of Idaho have been in dispute regarding whether and to what extent DOE is obligated to remediate substantial quantities of buried waste that underlie the INL. What is the status of any pending litigation involving this dispute and what is the DOE position regarding its cleanup obligations for this waste?

Mr. RISPOLI. This issue of the proper interpretation of provisions of the 1995 Settlement Agreement with regard to buried waste dispute has been tried before the Idaho District Court and the parties are awaiting that court's decision. The DOE's position is that the cleanup of buried waste is governed by the three party cleanup agreement among DOE, the EPA, and the State of Idaho (the 1991 Federal Facility Agreement and Consent Order) and not by the 1995 Settlement Agreement.

56. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your in-

formed views on the following question: How is DOE addressing any environmental risks associated with this waste?

Mr. RISPOLI. The DOE is addressing environmental risks associated with buried waste under the three-party cleanup agreement among DOE, the EPA, and the State of Idaho (the 1991 Federal Facility Agreement and Consent Order). DOE completed a draft Remedial Investigation and Baseline Risk Assessment for the buried waste and submitted it to the regulators in December 2005. DOE is also conducting certain waste retrieval activities and plans to complete additional studies and develop a remedial decision by 2008. All of these activities are being conducted according to processes established under the Comprehensive Environmental Response, Compensation, and Liability Act and the National Contingency Plan.

57. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Completion of cleanup at a number of EM sites depends on the timely shipment of quantities of transuranic waste to the Waste Isolation Pilot Plant (WIPP) in New Mexico for disposal. In some cases, DOE is under regulatory deadlines for completing shipments to WIPP. What regulatory deadlines does the EM program currently face related to WIPP shipments and what is the current progress against those deadlines?

Mr. RISPOLI. The DOE currently faces regulatory deadlines related to shipments of transuranic (TRU) waste to the WIPP at the INL and the LANL.

INL must comply with milestones contained in the Idaho Settlement Agreement. The milestones in this agreement that DOE currently faces are:

- After January 1, 2003, a running average of no fewer than 2,000 cubic meters per year shall be shipped out of the State of Idaho over 3-year period intervals (thus 6,000 cubic meters by December 31, 2005). INL shipped 6,000 cubic meters of TRU waste to the WIPP by February 21, 2006, and as of April 1, 2006, INL had shipped over 6,500 cubic meters of TRU waste to WIPP since January 2003. DOE will need to ship an additional 6,000 cubic meters by December 31, 2008.
- Additionally, a milestone requires that DOE shall ship all TRU waste now located at the INL, currently estimated at 65,000 cubic meters in volume, to the WIPP or other such facility by a target date of December 31, 2015, and in no event later than December 31, 2018. In total, as of April 2006, INL has made over 1,300 shipments and disposed of more than 10,400 cubic meters of TRU waste at the WIPP.

The Los Alamos Compliance Order on Consent signed on March 1, 2005 with the State of New Mexico, states that LANL's environmental restoration will occur by fiscal year 2015. This is tied to a DOE planning commitment that all legacy TRU waste will be removed by 2012. As of April 2006, LANL has shipped more than 140 shipments consisting of more than 800 cubic meters of TRU waste to the WIPP and continues to consistently make three to four shipments per week to the WIPP. It is estimated that LANL has approximately 10,000 cubic meters of TRU waste remaining to be shipped to WIPP.

58. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Are you aware of any issues that jeopardize DOE's ability to meet these deadlines? If so, what is DOE doing to address these issues?

Mr. RISPOLI. I am not aware of any issues that would affect the remaining two Idaho Settlement Agreement Milestones regarding shipment to the WIPP of certain stored waste from the State of Idaho. These milestones involve meeting deadlines for waste movement, including shipping 2,000 cubic meters per year out of the State of Idaho and shipping all stored TRU waste at the INL to WIPP by December 31, 2015, or not later than December 31, 2018.

The commitment in the Los Alamos Consent Order to complete environmental restoration by fiscal year 2015 is tied to a DOE planning commitment to complete legacy waste disposition by 2012. We believe that the new contract we have with Los Alamos National Security LLC (a limited liability corporation made up of Bechtel National, Inc., the University of California, BWX Technologies, Inc., and the Washington Group International, Inc.) will address these performance issues, offer us new opportunities to continue significant cleanup and risk reduction, and deliver progress towards a new baseline. To that end, senior officials within the DOE have asked for the involvement of senior executives of the parent companies of the new contractor to deliver efficiencies and a baseline that can withstand scrutiny and can

be validated by the DOE. We assure you that we remain committed to the Los Alamos Compliance Order on Consent with the State of New Mexico (March 2005) and its environmental milestones.

59. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: What, if any, additional permits or permit modifications are needed for WIPP in order to meet these deadlines?

Mr. RISPOLI. The INL and the LANL have contact-handled transuranic (CH-TRU) waste and waste which may be determined to be remote-handled transuranic (RH-TRU) waste that need to be disposed of at the WIPP. Getting CH-TRU and RH-TRU from INL and LANL to WIPP contributes to meeting the Idaho Settlement Agreement and the LANL Consent Order deadlines.

Currently, WIPP is only authorized to receive CH-TRU. DOE is in the process of seeking a permit modification from the New Mexico Environment Department (NMED) to allow for disposal of RH-TRU at WIPP, as well as changes in requirements for the disposal of CH-TRU as required by section 311 of Public Law 108-137.

60. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Cleanup under the EM program occurs not only at closure sites, but at DOE national laboratories and other sites with ongoing missions. These locations are sometimes distinguished from the closure sites by use of the term enduring sites. Does the EM program approach cleanup differently at closure sites than at enduring sites?

Mr. RISPOLI. No. The Office of EM's approach is the same at both closure sites and enduring sites. The operating principles for EM are to reduce risk and environmental liabilities, in accordance with applicable statutes and regulations. The EM program continues to eliminate significant environmental, health, and safety risks at all of its sites. At all of its sites, EM performs risk reduction and site closure or cleanup completion (in the case of sites with enduring missions) with its regulators and stakeholders to determine the most appropriate remediation schedules and approaches. EM continues to stay focused on its cleanup mission across the DOE complex and is working aggressively to enhance and refine project management approaches and to address the challenges inherent in this multifaceted environmental cleanup program.

61. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: How should the EM program best manage the interfaces between its cleanup operations and other ongoing missions at the enduring sites?

Mr. RISPOLI. The Office of EM works closely with the Field Office Managers, who have responsibility for all of the missions that are conducted at the site, and the other Program Secretarial Offices in the DOE to ensure that the cleanup mission is conducted safely and remains focused on reducing both risk and environmental liabilities. When it has been necessary, Memoranda of Understanding have been put in place for issues at several sites that clarify responsibilities for complex situations.

62. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Does the EM program prioritize work differently at enduring sites, and if so, in what way?

Mr. RISPOLI. No. The Office of EM's approach is the same at both closure sites and enduring sites. The operating principles for EM are to reduce risk and environmental liabilities, in accordance with applicable statutes and regulations. The EM program continues to eliminate significant environmental, health, and safety risks at all of its sites. At all of its sites, EM performs risk reduction and site closure or cleanup completion (in the case of sites with enduring missions) with its regulators and stakeholders to determine the most appropriate remediation schedules and approaches. EM continues to stay focused on its cleanup mission across the DOE complex and is working aggressively to enhance and refine project management approaches and to address the challenges inherent in this multifaceted environmental cleanup program.

63. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your in-

formed views on the following question: Secretary Bodman testified before this committee that DOE sites will not achieve compliance with the current design basis threat until 2008. Given the seriousness of the need to secure nuclear materials, both abroad and at home, do you believe that this is a sufficiently rapid response to the threats currently outlined by the intelligence community, and against which DOE has agreed it must defend at its nuclear sites?

Mr. RISPOLI. The DOE continually assesses information from the Intelligence Community as it relates to protection strategies employed at our facilities. While DOE has continued to strengthen the capabilities to defend against potential threat levels at our Category I quantity nuclear facilities, these facilities and our critical nuclear materials are at low risk based upon today's required protection criteria. We are continuing implementation of security enhancements through changes in tactics, manpower, and technology. Some of the security-effective and cost-effective solutions to design basis threat changes rely on capital improvements that require several years to design, procure, install, and/or construct. These active and passive technological capabilities, coupled with the sites' protective forces, provide a robust security posture ensuring our critical facilities and materials do not become an elevated risk overnight. Likewise, this robustness enables us to take immediate compensatory measures should there be an unexpected, sudden change to the actual threat.

Periodic assessments, enhancement plans, and plans to eliminate targets provide an appropriate security posture at our facilities to ensure low risk. We are proceeding at the appropriate pace to ensure threats will be met in an effective, timely, and efficient manner.

64. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: What actions would you undertake to consolidate and more rapidly secure any special nuclear material existing within the EM program?

Mr. RISPOLI. The Office of EM is focused on the disposition of special nuclear materials. Our consolidation decisions are closely connected to the ultimate disposition of these materials.

Additionally, the Principal Deputy Assistant Secretary for EM, is Chairman of the DOE's NMDCCC. Identifying a path forward for the plutonium-239 at our Hanford Site is EM's highest priority for the NMDCCC chiefly because of the urgency associated with removal of this material in order to avoid the expenditure of significant funding at Hanford to meet the latest security requirements.

65. Senator SESSIONS. Secretary Rispoli, please reexamine your response to the Senate Armed Services Committee provided on June 24, 2005, and provide your informed views on the following question: Do you agree that, even with a primary focus on accelerating cleanup, it is still an essential responsibility of the EM program to secure these materials against the threats existing now?

Mr. RISPOLI. The protection of weapons-usable nuclear materials is an essential responsibility of the Office of EM. As we clean up the former nuclear weapons complex, we are meeting this responsibility at our sites with appropriate safeguards and security systems, equipment, and manpower.

Through the NMDCCC, the DOE is evaluating consolidation options to further secure these critical nuclear materials and minimize costs to maximize cleanup resources.

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

COMPLEX RECONFIGURATION

66. Senator BILL NELSON. Ambassador Brooks, the 2001 Nuclear Posture Review (NPR) calls for a transition from a threat-based nuclear deterrent with large numbers of nuclear weapons to a deterrent based on capabilities with a smaller nuclear weapons stockpile and "greater reliance on the capability and responsiveness of the DOD and the NNSA infrastructure to respond to threats." Last June, the Energy Advisory Board issued a report, also known as the Overskei Report, suggesting a variety of ways to make the complex more responsive and more efficient. The Overskei Report concludes that the current NNSA plan to modernize the production complex in place was not effective and that the current complex "is neither robust, nor agile, nor responsive, with little evidence of a master plan." Neither DOE nor NNSA has responded to this report. What is the responsive infrastructure required by the NPR?

Ambassador BROOKS. The NNSA responsive infrastructure required by the NPR is the industrial capability for weapon design, certification, manufacturing, surveillance, maintenance, and disposition required to support our nuclear deterrent in an uncertain world. A responsive infrastructure provides a national security capability to respond to a major technical stockpile issue or a geopolitical change before an adversary could gain an advantage. Specifically, it allows us to replace large numbers of deployed and reserve weapons so that the augmentation or hedge component of the stockpile would not need to be maintained at current levels.

The NPR established responsive infrastructure as the third leg of the “New Triad,” making it equally important to strike and defensive forces as part of our nuclear security strategy. The NNSA infrastructure vision is a responsive set of national laboratories complemented by modern production centers of excellence. This responsive infrastructure includes the people, the science and technology base, the facilities, and equipment to support a right-sized nuclear weapons enterprise as well as practical and streamlined business practices that will enable us to be agile and respond rapidly to emerging needs. This responsive infrastructure must provide proven and demonstrable capabilities, on appropriate timescales, and in support of DOD requirements, to:

- Ensure needed warheads are available to augment the operationally deployed force;
- Identify, understand, and fix stockpile problems;
- Design, develop, certify, and begin production of refurbished or replacement warheads;
- Maintain capability to design, develop, and begin production of new or adapted warheads, if required;
- Produce required quantities of warheads;
- Dismantle warheads; and
- Sustain adequate underground nuclear test readiness.

67. Senator BILL NELSON. Ambassador Brooks, what steps has NNSA taken to implement all or any of the recommendations in the Overskei Report?

Ambassador BROOKS. The DOE has been actively reviewing the recommendations of the Secretary of Energy Advisory Board (SEAB) Nuclear Weapons Complex Infrastructure Task Force to prepare a comprehensive plan for transforming the nuclear weapons complex. Many of the recommendations are consistent with initiatives that the NNSA was already considering or is implementing. These initiatives include design of a RRW, consolidation of Special Nuclear Materials (SNM), accelerating dismantlement of retired weapons, managing the evolving complex to enhance responsiveness and sustainability, and establishing an Office of Transformation. With respect to the Consolidated Nuclear Production Complex (CNPC), the Complex 2030 preferred scenario consolidates production activities to distributed centers of excellence that minimize the number of facilities and size of the total and security footprint at each site. The cost profile and risk of implementation to ongoing activities are reduced compared to a CNPC implementation. For example, the CNPC option offers significant challenges in the selection of a location that would accept the large quantities of SNM and production activities, and how to minimize costs particularly during the construction of the CNPC. The concept of consolidated production centers of excellence allows NNSA to maintain expertise developed over decades of meeting stockpile deliverables, and, at the same time, allow us to more effectively manage costs and risks over the long-term. The NNSA seriously evaluated the CNPC alternative but found it to be both more costly in the near-term and risky to implement (e.g., adverse impact to ongoing activities like life extension programs). However, as we proceed with the scoping process for a potential programmatic environmental impact statement, we expect that a CNPC will be considered as an alternative.

68. Senator BILL NELSON. Ambassador Brooks, in your statement, you mention that NNSA has established an Office of Transformation. What is the job of this office?

Ambassador BROOKS. The Office of Transformation has not yet been, but will be, established in 2006. The function of this office is to drive change and to transform the nuclear weapons complex by establishing the path forward to our 2030 vision and managing execution of the Responsive Infrastructure Strategy Implementation Plan (RISIP), as well as all subordinate plans. The RISIP defines how the NNSA will achieve its 2030 vision and includes implementing strategies, goals, actions, and metrics. The Director of the Office of Transformation will be a senior NNSA Federal leader reporting to the Deputy Administrator for Defense Programs.

69. Senator BILL NELSON. Ambassador Brooks, when the NNSA begins to develop plans for the responsive infrastructure, what are the requirements that the infrastructure must meet?

Ambassador BROOKS. As required by the NPR, the infrastructure must be responsive to unanticipated stockpile issues, technological surprise, adverse geopolitical change, and it must enable increased reliance on deterrence measured by capability. To assist in our planning process, we have worked with the DOD to develop quantitative metrics to measure our progress towards "responsiveness." Following the NPR and the 2003 Stockpile Stewardship Conference, an initial set of these metrics was negotiated. These metrics provide quantified targets, e.g., resolve a new stockpile issue within 18 months. We have since updated these metrics and now anticipate monitoring our progress towards responsiveness in nine specific areas related to requirements for cost, dismantlement, augmentation, addressing stockpile problems, developing and producing warheads, demonstrating nuclear competencies, and sustaining underground test readiness. The Nuclear Weapons Council is expected to consider these responsive infrastructure metrics in June 2006.

70. Senator BILL NELSON. Ambassador Brooks, for instance, what is the planning assumption for the size of the stockpile, how many weapons should be assembled and dismantled each year, and how many pits and secondaries should be manufactured each year?

Ambassador BROOKS. [Deleted.]

DESIGN BASIS THREAT

71. Senator BILL NELSON. Ambassador Brooks and Secretary Rispoli, in 2003 the DOE issued a new Design Basis Threat (DBT) for which DOE installations must establish their security posture. This DBT was revised in December 2005. The goal is to have all installations and facilities meet the 2003 DBT by the end of 2006 and meet the 2005 DBT by the end of 2008. Could each of you identify any issues with any sites or facilities that would prevent reaching these goals?

Ambassador BROOKS. The NNSA is on-track to meet its commitment to implement the 2003 DBT upgrades by the end of this fiscal year, which has been a tremendous endeavor on the part of our sites. Regarding the 2005 DBT, the Department has requested that each site provide a detailed vulnerability analysis to validate the upgrades and resources required. The results of the site vulnerability analysis are being evaluated and we are looking closely at the options and impacts associated with the various upgrades so that risk management decisions can be made. We will achieve compliance with the November 2005 DBT at our two most critical activities (Pantex and our transportation safeguards asset) by the end of fiscal year 2008 and we are continuing diligently to identify requirements and funding at our other nuclear sites in order to achieve compliance as soon as possible.

Mr. RISPOLI. The Office of EM sites are implementing appropriate security measures to meet the 2003 DBT levels. The DOE has approved an exception to implementation of the 2005 DBT at Hanford to accommodate continued storage of surplus plutonium at the site pending an EM decision on off-site consolidation of the surplus plutonium. EM facilities with an enduring mission are expected to fully implement the 2005 DBT requirements by the end of 2008.

72. Senator BILL NELSON. Ambassador Brooks and Secretary Rispoli, do each of you have sufficient money in your budgets to meet the DBT goals?

Ambassador BROOKS. The 2007 budget has sufficient resources to accomplish the security upgrades to meet the new DBT at our two most critical operations, Pantex and the Office of Secure Transportation. For the remaining four sites, the budgets and schedules will be determined by the results of the ongoing vulnerability analyses and next year's budgeting process. NNSA is committed to doing as much as possible in the near-term to meet the DBT compliance requirements, and will maintain effective and robust security at all of its nuclear sites.

Mr. RISPOLI. The fiscal year 2007 budget request fully supports EM's goals and departmental decisions for the DBT implementation.

73. Senator BILL NELSON. Ambassador Brooks and Secretary Rispoli, in reviewing the 2007 budget request, there seems to be a number of projects with increased costs as a result of the revised DBT. Have each of you been able to identify ways to meet the DBT with technology, as opposed to more guards and guns, that will save money?

Ambassador BROOKS. The NNSA has been working tirelessly at finding innovative solutions to meet the challenges of the new security regimen. We have found that by maintaining our focus on the basics the Department can dramatically curtail the growth of protective forces. The basics include: hardening our facilities, creating vehicle standoff distances, increasing delay times, and improving the training, lethality, and survivability of the protective forces. The combination of these techniques, with innovative technologies such as remotely fired weapons and enhanced detection and assessment systems has given NNSA greater advantage in defending our nuclear sites. As NNSA plans for upgrades to meet the 2005 DBT, we continue to focus our efforts in the use of physical barriers and technology solutions rather than simply increasing the size of the protective force.

Mr. RISPOLI. Technology innovations, such as enhanced detection and assessment equipment, passive barriers, and upgraded weaponry, are being actively employed at the SRS and the Hanford Site to meet DBT requirements. These technologies enhance system protection effectiveness and minimize protective force-level increases.

74. Senator BILL NELSON. Ambassador Brooks, the DBT is designed to ensure that nuclear weapons and materials are secure. Does the DOD use the same DBT for developing security at its facilities where nuclear weapons are stored?

Ambassador BROOKS. The DOD and DOE use different approaches to providing a security foundational document (DBT), but we use the same intelligence and techniques in providing onsite protection. The two departments are working very closely on building common threat analyses modeling tools and security strategy development approaches. NNSA is confident that in the coming months and years you will see us working closer with our colleagues in the DOD on this very important topic.

75. Senator BILL NELSON. Ambassador Brooks, does it have the same time lines as DOE to come into compliance with the DBT?

Ambassador BROOKS. I would defer to the DOD to answer questions regarding any timelines it may have in meeting compliance requirements. In the DOE, we will be compliant with the May 2003 DBT by the end of this fiscal year.

CONSOLIDATION OF SPECIAL NUCLEAR MATERIALS

76. Senator BILL NELSON. Ambassador Brooks and Secretary Rispoli, one of the key recommendations of the Overskei Report was to consolidate all Category I and II special nuclear materials and weapons components at one site. Do you believe that it is possible to consolidate all of these materials into one site? If not one site, then how many?

Ambassador BROOKS. We take the recommendations of the Secretary of Energy Advisory Board Nuclear Weapons Complex Infrastructure Task Force very seriously and have been evaluating options to consolidate Category I and II quantities of special nuclear materials (SNM). Currently, seven of the eight locations that are part of the nuclear weapons complex have Category I/II quantities of SNM on their site. Consolidation to a single site would be extremely challenging. Our preferred approach is to significantly reduce the number of sites and the number of locations within any given site that have these materials (e.g., separate centers of excellence for uranium operations, plutonium operations, weapons assembly/disassembly, and testing).

Mr. RISPOLI. Consolidation to a single site would be extremely challenging. One of the primary objectives of the NMDCCC is to determine how to consolidate materials most effectively and to minimize the number of sites.

77. Senator BILL NELSON. Ambassador Brooks and Secretary Rispoli, what Category I and II materials do each of your programs have and what are each of you doing to consolidate materials?

Ambassador BROOKS. The NNSA sites that have Category I and II materials are the Y-12 National Security Complex, Pantex Plant, Nevada Test Site, Los Alamos, Lawrence Livermore, and Sandia National Laboratories. Office of EM materials are located primarily at the SRS and at Hanford, but there are also relatively small quantities at Los Alamos and Lawrence Livermore National Laboratories. EM is also assuming responsibility for disposition of U-233 materials consolidated at Oak Ridge National Laboratory.

The NNSA has construction projects to improve nuclear materials storage, security, and processing capabilities at Y-12 and Los Alamos National Laboratory, and disposition capabilities at the SRS. Materials at Hanford, Sandia National Laboratories, and Lawrence Livermore National Laboratory and excess materials at Los

Alamos National Laboratory will be relocated to sites with appropriate disposition capabilities, or where the material is needed in support of programmatic requirements.

Mr. RISPOLI. Within EM, the majority of our Category I materials are in a form of plutonium or uranium. The majority of the EM Category II materials are in a form of spent fuel, smaller quantities of plutonium or uranium, and solutions or residues in process systems. Onsite consolidation to a single-protected area has been completed at the Hanford Site and is scheduled to be complete at the SRS by the end of 2006. EM is working to clarify and finalize our disposition pathways and to determine a site to remove the SNM from Hanford, subject to compliance with applicable law including the National Environmental Policy Act. Additionally, the DOE has established the NMDCCC, of which EM is an active member. The purpose of the NMDCCC is to ensure integration of individual program disposition and consolidation efforts thus identifying opportunities for resource sharing.

78. Senator BILL NELSON. Ambassador Brooks, do you anticipate the NNSA will declare additional material excess in the next 10 years?

Ambassador BROOKS. In October 2005 the DOE announced a decision to restrict up to 200 metric tons of HEU from any further use as fissile material in nuclear weapons. Of that amount, approximately 20 metric tons was declared excess to programmatic requirements, and will be blended down to low enriched uranium for civilian power reactors or other uses. Approximately 20 metric tons was reserved for space and research reactors, and approximately 160 metric tons was reserved for naval reactors. Most of this material is in the form of assembled weapons components. As these weapon assemblies are disassembled, the materials will be evaluated to determine the appropriate disposition. Materials that do not meet the specification for use in the naval reactors program will be declared excess, and will be blended down to low enriched uranium. There are no current plans to declare additional plutonium excess.

79. Senator BILL NELSON. Mr. Rispoli, is the EM program ready to take responsibility for all excess category I and II material and begin to consolidate that material?

Mr. RISPOLI. The DOE currently is evaluating how best to manage the excess Category I and II nuclear material within the DOE complex. Surplus nuclear material associated with nonproliferation commitments is managed by the Office of Fissile Material Disposition in the NNSA.

80. Senator BILL NELSON. Mr. Rispoli, one of the key sites that could be used to consolidate materials is the SRS. Could additional materials be stored at SRS? What are you doing to work with the State of South Carolina to bring more materials to SRS?

Mr. RISPOLI. The Office of EM is focused on the disposition of SNM. Our consolidation decisions are closely connected to the ultimate disposition of these materials. Although the SRS has the capacity to store additional SNM, no final decision has been reached on shipping this material to a receiver site. The Secretary of Energy established the NMDCCC. This DOE-wide committee is chaired by the Principal Deputy Assistant Secretary for EM who reports to the Deputy Secretary of Energy for this purpose. The NMDCCC is in the process of evaluating this issue and expects to prepare a series of recommendations on consolidation. Meeting security requirements in a timely manner is a primary consideration. Other factors being considered include initial and life-cycle cost, transportation, National Environmental Policy Act analysis, timing, and equity issues.

RENDER SAFE

81. Senator BILL NELSON. Ambassador Brooks, the new Quadrennial Defense Review mentions on several occasions the need to be able to "render-safe" WMD. The NNSA has for years been responsible for the technical aspects of rendering safe nuclear devices. Is DOD expanding the render safe mission for nuclear devices and what is NNSA doing to support this expanded mission?

Ambassador BROOKS. NNSA continues to work very closely with the DOD. Presently, DOD has communicated the desire to enhance the capability of its generic (Tier 3) Explosive Ordnance Disposal capability. We do not expect this to add NNSA requirements, however. The DOD is still evaluating whether there is a need to develop any additional render-safe capability beyond the Tier 3 enhancement. NNSA

nevertheless will continue to work closely with DOD to provide the support DOD requires.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

82. Senator BILL NELSON. Ambassador Brooks and Mr. Rispoli, at times the DNFSB raises issues of operational safety in the design and construction of new buildings. Failure to resolve promptly the seismic concerns raised by the DNFSB at the Hanford Waste Treatment Plant has lead in part to the cost growth at that facility. Currently, the NNSA and the DNFSB are unable to resolve a nuclear safety issue associated with ventilation concerns at the new nuclear materials complex at Los Alamos National Lab, the Chemistry and Metallurgy Research Facility Replacement (CMRR) project. The DNFSB doesn't develop safety regulations, it identifies the appropriate regulations and is tasked with overseeing the DOE's proper implementation of the safety regulations. Is there a clear process to resolve the issues raised by the DNFSB?

Ambassador BROOKS. The DOE processes, functions, and responsibilities for interfacing with the DNFSB are delineated in the Department's Manual 140.1-1B, Interfacing with the Defense Nuclear Facilities Safety Board. This is derived from the DNFSB's enabling legislation which specifies the processes for accepting, rejecting, and implementing a DNFSB recommendation. The DNFSB communicates issues with the Department through a variety of mechanisms including formal recommendations, formal reporting requirements, letters requesting action and information, and letters providing information. The process used to resolve a technical issue is based on the mechanism used to communicate it to the Department. The Department's process encourages close communication with the DNFSB and its staff through briefings, discussions, site visits, and other informal interactions.

With respect to the specific classification of the ventilation system for the CMRR nuclear facility, the NNSA has performed preliminary analyses of the facility based on the conceptual design and concludes that the ventilation system will likely be classified as a safety system; however, verification of the safety classification properly awaits completion of the Preliminary Design and the Preliminary Documented Safety Analysis, activities which are just recently started. The designation of safety classification follows current protocols and procedures.

Mr. RISPOLI. The DOE processes, functions, and responsibilities for interfacing with the DNFSB are delineated in DOE Manual 140.1-1B, Interfacing with the Defense Nuclear Facilities Safety Board. The processes for the Secretary of Energy include rejecting a DNFSB recommendation and reporting that implementation is impracticable. Further, the DNFSB enabling legislation requires the DOE to notify the President and Congress if implementation is not possible due to funding. While not addressed specifically in the manual, the processes used for correspondence from the DNFSB are the same. To date, the DOE's interfacings with the DNFSB have provided an agreed upon solution to safety issues.

83. Senator BILL NELSON. Ambassador Brooks, what is the process to resolve the safety issues at the CMRR while that facility is still in the design phase?

Ambassador BROOKS. DOE Order 413.3, Project Management for the Acquisition of Capital Assets, and DOE Order 420.1, Facility Safety, provide design phase processes for the Department. The Department's Manual 140.1-1B, Interfacing with the Defense Nuclear Facilities Safety Board, establishes processes for interfacing with the DNFSB. The process is specified in the DNFSB's enabling legislation. The Department's process encourages early resolution of issues with the DNFSB and its staff through briefings, discussion, site visits, and other informal interactions. Where technical differences of opinion cannot be resolved informally and the DNFSB determines the issue requires formal resolution or more formal discussion, the DNFSB communicates to the Department through a variety of mechanisms including formal recommendations, formal reporting requirements or letters requesting action. DOE then determines how best to address the issue and interacts with the DNFSB and its staff to determine an agreeable path forward to resolution. In the case of the CMRR, discussions regarding technical differences are ongoing.

HANFORD WASTE TREATMENT PLANT

84. Senator BILL NELSON. Mr. Rispoli, your organization is in the process of building the WTP in Hanford, Washington, to vitrify the millions of gallons of high-level radioactive waste stored there in underground tanks. There have been many issues with the construction of that facility and the related management of the storage

tanks. These include multiple process and design changes, funding issues, an inability to resolve issues with respect to the appropriate seismic and other technical criteria, and substantial increases in the cost of concrete and steel. Early indications are that the cost of the facility may be on the order of \$10 to \$15 billion. Ironically the very first cost estimates for the WTP was in this range. How will the seismic issue be resolved and on what time schedule?

Mr. RISPOLI. Since your question refers to earlier estimates for the Hanford WTP, I would first like to point out that all prior planned designs for the WTP would have provided only one-fourth of the high-level waste immobilization capacity. The current plant is sized to treat and immobilize 100 percent of the high-level waste, thus eliminating the need for a second, very sizable plant that the DOE's prior plan envisioned. In addition, major advancements in technology have been recognized that will improve WTP performance. These advancements include development of an ion exchange material to more effectively and less expensively remove radioactive cesium from tank waste liquids; improvement of the throughput capacity for the large glass furnaces making glass out of radioactive waste; and enhanced blending ability of pumps to maintain a consistent mix of the waste. We anticipate that the benefits from these improvements will avoid the necessity of building a second plant for high-level waste, improve turnaround time, reduce personnel exposure, reduce performance risk, reduce operating cost, and reduce the total number of canisters produced, thereby decreasing the volume of material ultimately sent to a repository for permanent disposal.

With respect to the seismic issue, the DNFSB has been concerned with DOE's seismic assumptions used for WTP design. Last year, DOE developed interim seismic criteria based on agreement with the DNFSB on ground motion values. The WTP prime contractor, Bechtel National, Inc., used the interim seismic criteria to check the engineering calculations for the designs already completed and the structures already built. Bechtel National, Inc., submitted to the DOE a revision to the structural design criteria which incorporates the DOE's current best understanding of the seismic hazard at Hanford, and the WTP, as well as the assumptions from the interim seismic criteria. The DOE is reviewing this revision to the structural design criteria. The DOE has also engaged the U.S. Army Corps of Engineers to independently review this latest revision to the structural design criteria. The DOE will discuss this latest revision to the structural design criteria with the DNFSB and carefully consider its recommendation regarding the criteria, if any. The DOE expects the reviews and discussions to be completed by late summer 2006, to permit proceeding with construction of those portions of the facilities affected by the concern with the seismic criteria.

85. Senator BILL NELSON. Mr. Rispoli, how will a real cost estimate be completed and on what time scale?

Mr. RISPOLI. The WTP prime contractor, Bechtel National, Inc., provided to the DOE an updated Estimate-at-Completion (EAC) for the project in December 2005. DOE completed two independent expert reviews in March 2006 and provided to Congress: 1) an evaluation of the technical adequacy of the design to meet the contract performance rates; and 2) an assessment of the confidence in the cost and schedule as submitted by Bechtel in the December 2005 EAC. In addition, the contractor will deliver an updated EAC to reflect available funding for fiscal year 2006 and impacts of results of the independent technical and cost reviews. The contractor is to provide this revision to DOE by May 31, 2006.

DOE has also engaged the U.S. Army Corps of Engineers to perform an independent expert review of the EAC, and, if acceptable, to validate the EAC. The U.S. Army Corps of Engineers has retained a number of recognized industry experts working with its own senior staff. The U.S. Army Corps of Engineers' report is scheduled to be completed by late summer 2006.

Based on the results from the reviews, the DOE expects to establish a sound cost and schedule to complete the Hanford WTP. The objective is to ensure this project will be well-managed. We owe it to Congress, regional stakeholders, and the U.S. taxpayers that the substantial investment in the WTP is receiving the highest level of talent and attention the DOE can provide.

86. Senator BILL NELSON. Mr. Rispoli, will there be any independent validation of the cost, the design, and the vitrification process?

Mr. RISPOLI.

Cost

The WTP prime contractor, Bechtel National, Inc., provided the DOE an updated detailed EAC for the project in December 2005. Several actions are occurring to de-

velop a realistic project estimate and schedule. The DOE has implemented and received an independent expert cost review by senior industry professionals to assess the confidence in the cost and schedule as submitted in December 2005. This review was completed in March 2006. In late May 2006, the contractor will deliver an updated EAC based on the available funding for fiscal year 2006 and the impacts of results of the best and brightest technical and cost reviews. DOE also engaged the U.S. Army Corps of Engineers to perform an independent expert review of the EAC and to validate the EAC. The U.S. Army Corps of Engineers has retained a number of recognized industry experts working alongside its own senior staff. The U.S. Army Corps of Engineers' report is scheduled to be completed by late summer 2006.

Design

DOE completed an independent expert review in March 2006 and provided to Congress an evaluation of the technical adequacy of the design. The report indicated the WTP will work as designed, but identified 28 issues which needed to be resolved in order for the WTP to meet the contract performance rates. The review indicated all these issues can be resolved with existing technology. The contractor has begun incorporating the fix for a number of these issues and working with the DOE on alternatives for the remainder of these issues.

Vitrification

DOE has had an in-depth technology development program for vitrification systems over the past 20 years, to include the joule heated melter being designed for the Hanford WTP. The DOE has also had several vitrification systems in-use over the past 10 years: one at the West Valley Demonstration Project, New York, and two at the SRS, South Carolina (Defense Waste Processing Facility, and M-Area Vitrification Facility). In addition, there has been extensive testing of glass making in pilot facilities at the Duratek Inc., laboratory in Columbia, Maryland, and at the Catholic University's Vitreous State Laboratory in Washington, DC.

Based on the results from the professional reviews and years of experience and testing, the DOE has a high-level of assurance in the design, vitrification process, and the development of a sound cost and schedule to complete the Hanford WTP.

87. Senator BILL NELSON. Mr. Rispoli, what is the current status of construction at the WTP?

Mr. RISPOLI. The Hanford WTP consists of five subproject facilities: Pretreatment Facility, High-Level Waste Facility, Low-Activity Waste Facility, Analytical Laboratory, and Balance of Facilities. As of the end of fiscal year 2005, approximately \$2.9 billion had been spent on design, procurement, and construction activities. Based on the contractor's December 2005 EAC, the percent completion for the three elements (design, procurement and construction) of the project, as of the end of fiscal year 2005, are: design—68 percent; procurement/materials—44 percent; and construction—28 percent.

88. Senator BILL NELSON. Mr. Rispoli, the delays at the WTP will cause the DOE to miss many of the commitments to the State of Washington. One of the commitments that will not be met is pumping the waste from the single shell tanks. How many single shell tanks will be pumped out with the fiscal year 2007 budget request?

Mr. RISPOLI. Waste retrieval is anticipated to be completed on four single-shell tanks in fiscal year 2006 (C-204, C-103, C-201, and S-112). Waste retrieval will be initiated and completed on two single-shell tanks, C-108 and C-109, in fiscal year 2007. Retrieval on single-shell tank Tank S-102 is also anticipated to be completed in late fiscal year 2007 or early fiscal year 2008.

89. Senator BILL NELSON. Mr. Rispoli, no funding is provided for the bulk vitrification project in fiscal year 2007. Does this mean the DOE is cancelling the project?

Mr. RISPOLI. No. The DOE anticipates analyzing the bulk vitrification alternative in the upcoming Tank Closure and Waste Management Environmental Impact Statement pursuant to the National Environmental Policy Act. In addition, DOE would develop a Demonstration Bulk Vitrification System (DBVS) Project baseline that can be used to determine the path forward for the full DBVS Project tests. Substantial work has been performed to improve the basis for estimating project costs in accordance with DOE Order 413.3, Project Management for the Acquisition of Capital Assets. Using funding requested through fiscal year 2006, in fiscal year 2006-2007, DOE plans to complete the DBVS design; validate project costs; complete full-scale cold tests at the vendor's Richland, Washington, site; conduct an

independent review by a senior professional team from private industry, and academia; conduct an External Independent Review; complete a project baseline; and progress through the critical decision process for the DBVS required by DOE Order 413.3.

90. Senator BILL NELSON. Mr. Rispoli, if the project is terminated for 2007 and reconstituted at a later date, what is the increased cost, how much time will be lost, and what plans have been made to recover the workforce or hire and retrain a new workforce for the project?

Mr. RISPOLI. There is no plan to terminate the project. Rather, extensive activities are planned or are underway to develop a cost and schedule baseline and other information required to proceed through the critical decision process required by DOE Order 413.3, Project Management for the Acquisition of Capital Assets. In order to establish a baseline, there must be a valid basis to measure costs and schedules against. Until a valid baseline is in place, DOE cannot know what impacts there might be to the contractor workforce, if any.

91. Senator BILL NELSON. Mr. Rispoli, will cancellation of the bulk vitrification result in a failure to meet commitments to the State of Washington?

Mr. RISPOLI. There is no plan to terminate the project. Rather, extensive activities are planned or are underway to develop a cost and schedule baseline and other information required to proceed through the critical decision process required by DOE Order 413.3, Project Management for the Acquisition of Capital Assets. In order to establish a baseline, there must be a valid basis to measure costs and schedules against. Until a valid baseline is in place, DOE cannot know what impacts there might be to the contractor workforce, if any.

92. Senator BILL NELSON. Mr. Rispoli, how many commitments to the State of Washington will not be met in fiscal year 2007 or beyond given the fiscal year 2007 budget request?

Mr. RISPOLI. There are no TPA milestones that will be missed due to the fiscal year 2007 budget. However, some milestones are at risk because of other issues, such as overly optimistic assumptions that were in place when the milestones were established (e.g., failure to anticipate various technical issues that have since come to light), risk prioritization, bringing certain projects into line with the DOE's Project Management for the Acquisition of Capital Assets directive, further waste site characterization, increased volume projections, and prioritizing field data collection activities over paper generation activities. The DOE plans to manage these risks and to use its best efforts to meet the milestones. At this time, completion of hot commissioning of the WTP, Milestone M-62-10, remains the only milestone beyond fiscal year 2007 at risk because of the aforementioned issues.

93. Senator BILL NELSON. Mr. Rispoli, has DOE started any discussions with the State of Washington to modify the various commitments under the TPA?

Mr. RISPOLI. Currently, the Richland Operations Office is discussing changes in Central Plateau Cleanup and Waste Management. These discussions involve adjusting milestones to allow for further characterization of waste sites and adjusting waste treatment milestones to reflect revised retrieval volume projections. The TPA parties recognized changes would be necessary and included a formal change control process in the TPA. The DOE uses its best efforts to initiate discussions or notify the document signatories of potential milestone impacts in a timely manner. For example, the Office of River Protection notified the Washington State Department of Ecology and the Region 10 Offices of the TPA milestones impacted by the delays in the construction and operation of the WTP on January 31, 2006. Additionally, the Office of River Protection initiated discussions in February 2006 with the Washington State Department of Ecology regarding other near-term TPA milestones that were impacted by the WTP delays or other performance and technical issues.

ENVIRONMENTAL TECHNICAL EXPERTISE

94. Senator BILL NELSON. Mr. Rispoli, what additional steps could you take to utilize the DOE national laboratories to ensure that shortfalls in EM technical expertise are addressed?

Mr. RISPOLI. I consider the DOE's national laboratories an important resource to assist the DOE environmental cleanup mission. As such, continued use of the national laboratory technical experts in the Office of EM technical projects and activities is vital. EM is in partnership with four national laboratories to obtain assist-

ance in identifying emerging issues and providing more technical assistance across the EM complex. The labs can provide rapid response to address current technical problems impeding site cleanup by evaluating new and innovative approaches that result in cost savings or improvements to waste disposition pathways. In addition, national laboratory technical experts participate in longer duration evaluations to develop alternatives to the larger site baselines in order to decrease life-cycle schedule and costs. National laboratories also conduct research in collaboration with Russian scientists and engineers to develop high-level waste treatment technologies, for example.

EM is placing an increased emphasis on strengthening the technical competencies of its Federal workforce through a multi-pronged approach. This evolving approach includes the certification and qualification of employees, development and sponsorship of training courses in specific EM technical competencies, increased recruitment of mid-level and career intern employees with technical experience and education, and encouragement of employee participation in technical and professional societies.

QUESTIONS SUBMITTED BY SENATOR JACK REED

NUCLEAR STOCKPILE REDUCTIONS

95. Senator REED. Ambassador Brooks, many times in your prepared statement you talk about reductions, significant reductions, in the nuclear weapons stockpile and you state that the 2001 NPR called for a “transition from a threat-based nuclear deterrent with large numbers of deployed and reserve weapons to a deterrent based on capabilities, with a smaller nuclear weapons stockpile.” What dismantlement decisions have been made and implemented since 2001 to achieve the reductions?

Ambassador BROOKS. [Deleted.]

96. Senator REED. Ambassador Brooks, in what way is the stockpile smaller today than it was in 2000?

Ambassador BROOKS. [Deleted.]

97. Senator REED. Ambassador Brooks, what part of the transition discussed in the 2001 NPR has occurred and what is planned?

Ambassador BROOKS. [Deleted.]

98. Senator REED. Ambassador Brooks, how many dismantlements are planned for fiscal year 2006 and for fiscal year 2007 and which weapons will be dismantled in each year?

Ambassador BROOKS. [Deleted.]

99. Senator REED. Ambassador Brooks, currently there are roughly four weapons in reserve or inactive or other status in the stockpile for every weapon deployed. Under the 2001 NPR, is there a goal to reduce this ratio?

Ambassador BROOKS. [Deleted.]

100. Senator REED. Ambassador Brooks, will the RRW program allow a reduction in this ratio? What is the goal and what is a reasonable ratio?

Ambassador BROOKS. Last April, before this committee, I provided a statement indicating that the RRW, if ongoing studies validated the feasibility of RRW designs, will be the “enabler” to achieve the infrastructure and stockpile transformation that is needed for the Nation’s future nuclear deterrent. Once we establish a responsive infrastructure, can demonstrate that we can produce RRWs on a timescale in which geopolitical threats could emerge, and can respond in a timely way to technical problems in the stockpile, then I believe we can go much further in reducing non-deployed warheads.

If we can demonstrate feasibility of higher margin replacement warheads and components that increase confidence in the stockpile, we believe this will allow further reductions in the stockpile. Additionally, we believe these more easily manufactured replacement warheads will provide an opportunity to transform to a more responsive, cost effective, and efficient infrastructure that will then provide more opportunities for additional stockpile reductions. A more responsive infrastructure will allow less reliance on the non-deployed stockpile for risk reduction, and lead to more reliance on the infrastructure (i.e., ability to produce additional or repair warheads in sufficient quantity) in responding to technical failures or new and emerging

threats of the 21st century. Our ability to reduce the stockpile in the years beyond 2012 will depend critically on continued progress in achieving the RRW and responsive infrastructure goals.

101. Senator REED. Ambassador Brooks, you state in your testimony that by 2012 the stockpile will be “the smallest stockpile since the Eisenhower administration.” What is the annual dismantlement plan to achieve this reduction?

Ambassador BROOKS. [Deleted.]

102. Senator REED. Ambassador Brooks, how do you quantify this reduction based on the total number of weapons in the stockpile today—50 percent, 25 percent, 10 percent?

Ambassador BROOKS. [Deleted.]

[Whereupon, at 4:22 p.m., the subcommittee adjourned.]

**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2007**

WEDNESDAY, MARCH 29, 2006

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington DC.

GLOBAL STRIKE PLANS AND PROGRAMS

The subcommittee met, pursuant to notice, at 2:35 p.m. in room SR-222, Russell Senate Office Building, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions and Bill Nelson.

Other Senators present: Senator Byron L. Dorgan

Majority staff members present: Stanley R. O'Connor, Jr., professional staff member; Lynn F. Rusten, professional staff member; Robert M. Soofer, professional staff member; and Kristine L. Svinicki, professional staff member.

Minority staff members present: Madelyn R. Creedon, minority counsel; and Richard W. Fieldhouse, professional staff member.

Staff assistants present: Jill L. Simodejka and Pendred K. Wilson.

Committee members' assistants present: Arch Galloway II, assistant to Senator Sessions; and William K. Sutey, assistant to Senator Bill Nelson.

STATEMENT OF SENATOR JEFF SESSIONS, CHAIRMAN

Senator SESSIONS. The meeting will come to order. I'm pleased to welcome our witnesses today—General James Cartwright, Commander of the U.S. Strategic Command (USSTRATCOM); Peter Flory, Assistant Secretary of Defense for International Security Policy; Rear Admiral Charles Young, Director of the Navy's Strategic Systems Programs; and Major General Stanley Gorenc, Director for the Air Force Operational Capabilities Requirements. That's a mouthful.

General GORENC. It is a mouthful.

Senator SESSIONS. Gentlemen, I thank you for your service to your Nation. Many good things have occurred, and I know you are thinking creatively and long range and to try to configure us in a way we need to be for the short-term future and the long-term future, and we're glad to have you join us today. We will receive testimony today on the Department of Defense's (DOD) policy plans

and programs for global or strategic strike. During the Cold War, the term “strategic strike” was associated with the use of long-range nuclear forces to deter the former Soviet Union. Today, strategic forces must provide the President and the warfighter a range of capabilities to address a new global security environment where rogue states armed with weapons of mass destruction (WMD) and violent extremists have to be added to the list of strategic challenges. This new concept for strategic strike, now commonly referred to as global strike, was codified in the 2001 Nuclear Posture Review (NPR) conducted by the DOD.

Oh, Senator Nelson, great to have you with us. One of the principal tenets of the NPR was a greater emphasis on advanced conventional weapons as a means to reduce dependency on nuclear forces to provide an offensive deterrent. While the United States is well on its way toward reducing the nuclear forces of some 2,200 operationally deployed warheads, by 2012, it is less clear that our improved conventional strike capabilities are maturing as quickly as they should be. For example, the June 2005 Prompt Global Strike Plan submitted to Congress noted, “For the near future, in the event of a rapidly-developing crisis, the DOD will not have non-nuclear, long-range precision strike options for consideration by the national leadership.” The budget request before us includes \$127 million in fiscal year 2007 to address this gap in the near-term by modifying 24 of the existing nuclear-armed Trident D-5 Submarine-Launched Ballistic Missiles (SLBMs) that carry conventional warheads, not nuclear. The capability to strike virtually anywhere on the face of the Earth within 60 minutes could provide the President with the means to preempt dangerous threats to the United States and its allies and could well become one of the more important deterrent tools in our Nation’s strategic arsenal. One example that might serve to illustrate the potential importance of this capability is that at the outset of the March 2003 campaign in Iraq, the United States launched an attack with F-117 fighters and sea-launched cruise missiles in an attempt to decapitate the Iraqi leadership.

According to the press reports, this strike took 4 hours to execute. Despite the fact that U.S. forces were already deployed in the region. Wouldn’t it be in our interest to have the capability to launch our strike within 30 or 60 minutes? We are mindful, however, that there may be risks associated with plans to collocate conventional and nuclear Trident missiles on the same submarine. How, for example, would other nuclear powers interpret U.S. intentions during a launch? In determining whether to go forward with this program, we will need to weigh carefully the potential benefits of this new capability against the perceived risks. To help us make this determination, the committee also needs to be aware of other prompt global strike capabilities to include land-based options available to the Department in the near-term and over time.

While addressing non-nuclear strike options, we must bear in mind that nuclear weapons are uniquely capable of holding certain critical targets at risk and that the size and structure of our nuclear deterrent forces will continue to play an important role in our national security posture. It is in this context that we will consider the Department’s plans to reduce the number of operationally-de-

ployed Minuteman III Intercontinental Ballistic Missiles (ICBMs) from 500 to 450. These are just some of the issues we intend to explore in our hearing today. Let me now recognize my distinguished ranking member, Senator Nelson of Florida. I appreciate his partnership and his interest in matters relating to our Nation's defense.

Senator Nelson, we welcome any remarks you have.

STATEMENT OF SENATOR BILL NELSON

Senator BILL NELSON. Thank you, Mr. Chairman. We have three issues to discuss today—(1) the proposal to convert the 24 Trident D-5 Sea-Launched Ballistic Missiles to carry 4 non-nuclear warheads each and replace 2 of the 24 nuclear D-5 missiles on 12 Trident submarines with 2 non-nuclear D-5 missiles; (2) the proposal to retire 38 B-52H bombers by 2008. The most immediate issue, however, is the decision to terminate the two B-52 upgrade programs by the end of this month, effectively foreclosing the consideration of this proposal by Congress; and (3) the lack of a decision with respect to the nuclear cruise missiles—should they be retired or retained? While this discussion is going on within the DOD, the Department of Energy (DOE) is spending \$100 million per year to begin a life extension program on the W-80 Nuclear Warhead in 2010, the nuclear warhead that is flown by all three cruise missiles. The decision needs to be made quickly on the missiles. If the W-80 is to be retired, then we shouldn't waste the \$100 million per year.

Thank you, Mr. Chairman.

Senator SESSIONS. Thank you. Senator Dorgan, we are delighted to have you as a guest of our committee. Do you want to say something before we begin with our guests?

Senator DORGAN. Mr. Chairman, thanks for inviting me. I'm anxious to hear the testimony today, and I appreciate your willingness to allow me to sit in.

Senator SESSIONS. Thank you very much. Then we'll start with Secretary Flory. Each of you that desire to make an opening statement, we'd be delighted to hear you. If you'd like to give abbreviated remarks and submit full remarks for the record, we'll accept that also.

Secretary Flory.

STATEMENT OF HON. PETER C.W. FLORY, ASSISTANT SECRETARY OF DEFENSE FOR INTERNATIONAL SECURITY POLICY

Mr. FLORY. Thank you, Mr. Chairman. With your permission, I'll do just that. I will give a shorter opening statement and ask that my entire statement please be included in the record.

Senator SESSIONS. Very well.

Mr. FLORY. Chairman Sessions, Senator Nelson, Senator Dorgan, I welcome the opportunity to testify before the subcommittee today to describe our progress in transforming the Nation's strategic capabilities. I want to thank you and the other members of the subcommittee for your continued support in this important endeavor. The successful transformation of our capabilities will require a sustained partnership between the DOD and Congress.

As the recently published National Security Strategy (NSS) notes, the new strategic environment requires new approaches to deterrence and defense. Our deterrence strategy, as the chairman pointed out in his opening remarks, no longer rests solely on our ability to inflict devastating consequences on potential foes. Today, a more discriminate approach and a broader range of options and capabilities—including both offenses and defenses—contribute to the deterrence of state and non-state actors by denying them their objectives and, if necessary, by responding with overwhelming force.

Our strategy for transforming U.S. strategic forces is contained in the NPR of December 2001. The NPR was written in response to congressional direction, and reflected Presidential guidance to reduce U.S. reliance on nuclear weapons to the lowest levels consistent with U.S. national security and our commitments to allies.

The NPR called for an overhaul of U.S. strategic forces and concepts and provided a framework to guide their future development in a new and uncertain environment that we found ourselves in following the attacks of September 11, 2001. The NPR did a number of things. Notably, it directed reductions in the number of operationally-deployed strategic nuclear warheads from around 6,000 to levels between 1,700 and 2,200 by 2012. The NPR also established a so-called New Triad composed of offensive strike systems to include nuclear, non-nuclear, and non-kinetic capabilities that can generate strategic effects promptly and precisely and at great range. It also included defenses, both active and passive, as well as a responsive defense infrastructure which includes the U.S. nuclear weapons complex to provide new capabilities in a timely fashion to meet emerging threats.

When fully implemented, the New Triad can provide the range of capabilities and options needed for a credible deterrent against a wide range of potential adversaries whose values and calculations of risk, gain, and loss may be very different from and, in many ways, harder to discern than those of past adversaries. These capabilities will also be important should deterrence fail. The New Triad is designed to transform our strategic capabilities to deal with an uncertain future, and it reflects new thinking about the meaning and purpose of U.S. strategic capabilities.

For example, during the Cold War, the term strategic strike was virtually synonymous with the employment of nuclear weapons. This is no longer so. The development of precision targeting, flexible and collaborative planning, and improved intelligence and surveillance capabilities now enables us to envision using highly precise and responsive conventional systems to achieve strategic effects. So today, in appropriate areas, we are adding and need to continue to add conventional global strike to the mix of our capabilities.

During the Cold War, we also designed our strategic nuclear forces to deter a single foe, the Soviet Union, and generally treated all others as lesser-included cases.

Today, a one-size-fits-all approach to deterrence is no longer appropriate. Today, we must tailor deterrence to fulfill a number of functions: to assure our allies and friends; to achieve specific effects against a wide range of potential adversaries and circumstances,

such as advanced military competitors or nuclear competitors, regional WMD states, and non-state terrorist networks.

We cannot predict with confidence which nations or nation, which non-state actors, or which combination of the above may pose a threat to our vital interest or those of our friends and allies and how such a threat might materialize and what form and attack it might take. As the NPR noted, the September 11 attacks dramatically illustrated the unparalleled extremism, hostility, and unpredictability of some foes.

The NPR was only a starting point for the transformation of our strategic capabilities and concepts. Since December 2001, the Office of the Secretary of Defense (OSD), the Joint Staff, USSTRATCOM, and the Services have been working together to develop detailed implementation plans and operational concepts. I would like to highlight some examples of our progress to date. New missions have been assigned to USSTRATCOM to General Cartwright here and his crew out in Omaha beyond their continuing responsibility for strategic nuclear forces. These include global strike, integration of missile defense, space operations, integration of command, control, communications, and intelligence, offensive information operations, and integrating and synchronizing DOD's role in combating WMDs. I know General Cartwright will have more to say on his response to these many challenging tasks.

We have made significant progress in a number of areas. For example, we have fielded an initial ballistic missile defense capability at Fort Greely, Alaska, and Vandenberg Air Force Base, and we have initiated additional cooperation and participation in our missile defense program. We are reducing U.S. nuclear forces to between 1,700 and 2,200 operationally-deployed strategic nuclear warheads by 2012 and are on track to meet our interim goal of 3,800 warheads by 2007.

We are also making progress in developing non-kinetic strike capabilities and improving planning, intelligence, and command and control capabilities to integrate our New Triad effectively.

There are some areas, however, as you pointed out, Mr. Chairman, where we have made less progress. These include fielding prompt conventional capabilities for global strike, transforming a Cold War nuclear arsenal to meet new challenges, and revitalizing our nuclear infrastructure.

We are working hard to make greater progress in these areas to realize the full potential and the broad mix of capabilities called for in the NPR. For example, we need the systems to be in a position where in a regional crisis against an adversary armed with WMD, the credibility of our deterrent may turn on our ability to threaten highly-valued assets of importance to that state's leadership while minimizing collateral damage. These assets may include WMD, missiles, command and control facilities, or leadership bunkers, any one of which may be protected in hard or deeply-buried facilities. Conventional global strike capabilities are needed to augment our existing military options for holding such targets at risk, and we need to expand the range of prompt, long-range strike options available to the President, options which are currently limited to nuclear weapons.

Fielding this New Triad will strengthen the overall credibility of our deterrent posture and maintain the nuclear threshold at an appropriately high level and reduce our reliance on nuclear weapons.

At the same time, this more flexible and capable strategic posture can help address all four pillars of our defense strategy. I mentioned earlier the capability to assure our allies and friends to help dissuade potential adversaries from investing in capabilities to challenge the United States and to help deter and, if necessary, defeat aggression.

While our national strategy calls for reduced reliance on nuclear weapons, these weapons will continue to play a critical role. Nuclear weapons provide credible military options to deter a wide range of threats, including chemical, biological, radiological, and nuclear weapons as well as large-scale aggression. Nuclear weapons possess unique properties that give the United States options to hold at risk target classes that cannot be countered through non-nuclear means.

What we need here is not a smaller version of a Cold War-era nuclear stockpile, we need capabilities that are appropriate for the 21st century.

To accomplish the transformation of our nuclear stockpile, it will be necessary to restore the Nation's nuclear infrastructure. Revitalizing and restoring the nuclear weapons infrastructure is essential to assure the long-term safety and reliability of U.S. nuclear warheads and to provide a hedge against an unforeseen, catastrophic technical failure and any element of our nuclear force or against adverse geopolitical changes.

To assist in transforming the stockpile and to help place the nuclear infrastructure on a sound footing, one important near-term initiative is the Reliable Replacement Warhead (RRW). The RRW program will ensure the long-term sustainability of a stockpile by, among other things, eliminating hazardous materials and simplifying warhead manufacturing—all of this to be done without nuclear testing. If successful, the RRW may enable further reductions in the size of the stockpile by demonstrating a real capability to manufacture highly RRWs. In this respect, the RRW may be a first step towards the responsive nuclear weapons infrastructure called for by the NPR.

The Quadrennial Defense Review (QDR) that was completed in February was another extensive review of all of the Department's capabilities that took a very close look at deterrence and the capabilities that we need to maintain our deterrence.

Among other things leading into the QDR, we had another study in 2004–2005, which reviewed the fundamental assumptions of the NPR. This was the Strategic Capabilities Assessment. In the course of that, the Defense Intelligence Agency (DIA) reviewed our original planning assumptions, the original planning assumptions that had guided the decisions we made, both to reduce our nuclear warheads and to develop the New Triad and noted that those assumptions were still valid. However, DIA pointed out that to the extent that conditions were changing, to the extent that the trend was different from what was predicted, it was trending, if anything, toward a more-stressing rather than a less-stressing strategic landscape—for example, with respect to developments in

North Korea, Iran, and general nuclear proliferation. These same assumptions were reviewed and revalidated in the 2006 QDR when, as I mentioned earlier, the senior civilian and military leadership of the Department reviewed areas associated with implementation of the NPR and development of the New Triad and our overall defensive posture. As I noted earlier, the U.S. needs to tailor its strategy of deterrence to each potential adversary across a wide range of scenarios.

Specifically, the QDR concluded that the U.S. needs to tailor its strategy of deterrence to each potential adversary, that we need to make greater progress in fielding prompt, accurate, non-nuclear global strike capabilities and that we can also make further modest reductions in the strategic nuclear force structure with minimal risk. I will touch briefly on each of these QDR conclusions. First, with respect to tailored deterrence, the U.S. needs to tailor its deterrence to each potential adversary across a wide range of scenarios. This means having the capability to create specific and appropriate effects to influence the decisionmaking of each potential adversary. Tailored deterrence will require that we understand each potential adversary to a greater degree than in the past. As I noted earlier, this may actually be harder to do than it was in the past. Tailored deterrence also means that our declaratory statements will need to be tailored so that our policy statements and our operational capabilities work together to send the same message and to strengthen deterrence.

Second, with respect to global strike and the need to deploy a conventional global strike capability, as an element of a more-tailored, deterrent posture, we need to deploy, within 2 years, an initial capability that will allow us to promptly engage targets globally with precision-guided conventional weapons. This is the conventional Trident missile system, Mr. Chairman, Senator Nelson, that you mentioned in your opening remarks. The way we plan to achieve this is by arming a small number of long-range Trident missiles with accurate, non-nuclear warheads. This system would represent a near-term, affordable, relatively off-the-shelf and low-risk option for providing the President of the United States with an important capability that he does not have today. By deploying conventional Trident, we close a longstanding gap in our conventional strike capability for engaging an adversary promptly and precisely anywhere in the world.

I understand there is concern, and this was mentioned in your opening remarks, Mr. Chairman and Senator Nelson, that there is a risk that the operational launch of a non-nuclear Trident missile might cause other nations—for example, Russia or China, to mistake such a launch for a nuclear attack. The U.S. has employed dual-role weapon systems in many years, and in fact, has done a number of missile tests from Trident and other submarines. But we recognize that a non-nuclear Trident missile aboard an SSBN will, in fact, represent a significant new development, and this is a concern that we take very seriously. I should point out that for the near-term, only Russia will have the ability to detect and respond promptly to ballistic missile launches of any kind. I think it's important to note that we already have in place, both with respect to Russian leaders—and is also concerned about the Chinese leader-

ship—we have, with respect to the Russian and Chinese leaders, hotlines and other means for emergency communications that would be an important part of our strategy for mitigating any potential risk of misperception here.

In addition to hotlines and the potential for advanced notification of a launch, we have other means for creating transparency and building confidence. One of those would include military-to-military talks between our respective forces so that others would understand our concept of operations for this new capability. Other options would include ways in which we could structure and operate the system to provide a notably different launch phenomenology, for example, different tasking and authorization procedures so that a launch of one of these systems would not, in fact, look just like a launch of a nuclear system.

Again, we take seriously the risks that have been expressed about the possibility of a misperception. We think we have measures in place that would be able to mitigate this risk, and we think that it's on balance. The benefits that could be gained from this system are substantial, and the risks, while there are things that need to be taken seriously, they are things that we can confidently manage.

In this context, it is important to remember that while any military action involves risks, there may also be risks and sometimes, very serious regrets in not acting. By developing and deploying this system, what we intend to do is to provide the President with one more option with which he can choose to act or not act or however he wants to proceed with respect to threats against the United States. It's a question of filling in a range of options that is not fully filled in right now.

My last point, with respect to the further reductions in the ICBM force, we have made considerable progress in reducing our operationally-deployed strategic weapons, as I noted earlier. In light of this progress, the QDR has reevaluated our strategic nuclear force posture and determined that with minimal and acceptable risk, we could make further modest reductions and retire 50 Minuteman IIIs. This represents a 10-percent reduction in the size of the Minuteman III force as envisioned by the NPR in 2001.

Mr. Chairman, once again, in conclusion, we need a sustained partnership between the DOD and Congress if we are to transform our Nation's strategic capabilities to meet the uncertainties and challenges ahead. The Department will require your and the subcommittee's and the chairman's and the full committee's and the entire Congress's support as we continue to replace the legacy Cold War force posture with a New Triad that will protect our Nation in the new security environment.

I look forward to answering your questions. Thank you.

[The prepared statement of Mr. Flory follows:]

PREPARED STATEMENT BY PETER C.W. FLORY

I. OPENING REMARKS

Chairman Sessions, Senator Nelson, and distinguished members of the subcommittee: I welcome the opportunity to testify before the subcommittee to describe our progress in transforming the Nation's strategic capabilities. I know that you understand the importance of this effort and that you recognize the need to replace a force posture configured for the Cold War with a New Triad that is better suited

to the new security environment. I want to thank the members of the committee for your continued support in this effort. Successful transformation of our capabilities will require a sustained partnership between the Department of Defense (DOD) and Congress.

II. THE NUCLEAR POSTURE REVIEW: A CATALYST FOR CHANGE

As the recently published National Security Strategy (NSS) notes, the new strategic environment requires new approaches to deterrence and defense. Our deterrence strategy no longer rests solely on an ability to inflict devastating consequences on potential foes. Today, a more discriminate approach and a broader range of capabilities—including both offenses and defenses—contribute to deterrence of state and non-state actors, by denying them their objectives and, if necessary, by responding with overwhelming force.

Our strategy for transforming U.S. strategic forces is contained in the Nuclear Posture Review (NPR) of December 2001. The NPR was written in response to congressional direction, and reflected Presidential guidance to reduce U.S. reliance on nuclear weapons to the lowest levels consistent with U.S. national security and our commitments to allies.

The NPR called for an overhaul of U.S. strategic forces and concepts, and provided a framework to guide the future development of these forces in the new and uncertain environment we found following the attacks of September 11, 2001. The NPR directed reductions in the number of operationally deployed strategic nuclear warheads from around 6,000 to levels between 1,700 and 2,200 by 2012. The NPR also established a New Triad composed of:

- Offensive strike systems—to include nuclear, non-nuclear, and non-kinetic capabilities that can generate strategic effects promptly and precisely, and at great range;
- Defenses—both active and passive; and
- A responsive defense infrastructure—including the U.S. nuclear weapons complex—to provide new capabilities in a timely fashion to meet emerging threats.

These New Triad capabilities will be integrated by improved planning, intelligence, and command and control.

When fully implemented, the New Triad can provide the range of capabilities and options needed for a credible deterrent against a range of potential adversaries whose values and calculations of risk, gain and loss may be very different from—and more difficult to discern than—those of past adversaries. These capabilities will also be important should deterrence fail. This New Triad is designed to transform our strategic capabilities to deal with an uncertain future, and reflects new thinking about the meaning and purpose of U.S. strategic capabilities.

For example, during the Cold War the term “strategic strike” was virtually synonymous with the employment of nuclear weapons. This is no longer so. The development of precision targeting capabilities, flexible and collaborative planning systems, net-centric national command and control systems, and improved intelligence and surveillance capabilities now enable us to envision using highly precise and responsive conventional weaponry to achieve strategic effects that once required nuclear weapons. Today, in appropriate areas, we can add conventional Global Strike to the mix of capabilities able to achieve strategic effects.

During the Cold War, the main challenge facing the United States was deterring the former Soviet Union from using weapons of mass destruction against the United States and its allies. At that time we designed our strategic nuclear forces to deter a single foe, and generally treated all others as “lesser included cases.”

The new security environment is much-changed, however. As noted in the Quadrennial Defense Review (QDR) released last month, Russia is unlikely to pose a military threat to the United States or its allies on the same scale or intensity as the Soviet Union during the Cold War, although it remains a country in transition. It is no longer an adversary but not a traditional ally. Of the major and emerging powers, China has the greatest potential to compete militarily with the United States, and there are potential flash points with which we must be concerned, such as Taiwan.

At the same time the United States faces a threat from an expanding number of hostile regimes and terrorist groups that seek to acquire and use weapons of mass destruction (WMD). Even when they do not pose a direct threat to the United States, these States may threaten the U.S. or its allies indirectly by transferring weapons or expertise to terrorists. The United States cannot predict with confidence which nation, nations, non-state actors, or a combination of the above may pose a threat to its vital interests, or those of its friends and allies, in the decades ahead.

As the NPR noted: “The September 11 attacks dramatically illustrated the unparalleled extremism, hostility, and unpredictability of some foes. . . .”

In this new and uncertain environment, a “one size fits all” approach to deterrence is no longer appropriate; we must re-think our approach to 21st century threats and tailor deterrence to assure our allies and friends, and achieve specific effects against a wide array of potential adversaries and circumstances, such as advanced military competitors, regional WMD states, and non-state terrorist networks. To do this we must have a broad range of credible strategic capabilities—including a mix of nuclear and non-nuclear Global Strike capabilities, defenses, and a revitalized and responsive infrastructure.

The NPR of 2001 set forth, and was based on, the following assumptions:

- Expect Surprise;
- Unpredictable Future;
- Deterrence continues to be important, but uncertain;
- Future adversaries (e.g., rogue states) possess WMD; Denial and deception complicate characterization of WMD facilities;
- Terrorists and non-state actors seek WMD;
- China modernizing conventional and nuclear forces; Taiwan a potential flash point; and
- Russia no longer an adversary, but uncertain future.

Since its publication in December 2001, the logic, strategy, and the fundamental assumptions of the NPR have been reviewed periodically and subjected to rigorous internal scrutiny, for example, in the 2004–2005 Strategic Capabilities Assessment. Based on the Defense Intelligence Agency’s assessment, the 2004–2005 Strategic Capabilities Assessment concluded that the NPR’s planning assumptions remain valid, although conditions are trending toward—if anything—a more stressing strategic landscape, for example, with respect to North Korea, Iran and nuclear proliferation. Additionally, we are increasingly concerned over the sale to others of disruptive weapons technologies by Russia—a country in transition—as well as by others. These same assumptions were revalidated by the 2006 QDR.

But the NPR was only a starting point for the transformation of U.S. strategic capabilities and concepts. Since December 2001 the Office of the Secretary of Defense, the Joint Staff, U.S. Strategic Command (USSTRATCOM), and the Services have been working together to develop detailed implementation plans and operational concepts. I would like to highlight some examples of our progress to date:

1. New missions have been assigned to USSTRATCOM beyond its continuing responsibility for strategic nuclear forces. These include:
 - Global Strike—to include nuclear, non-nuclear and non-kinetic effects;
 - Integration of Missile Defense;
 - Space Operations;
 - Integration of Command, Control, Communications, and Intelligence;
 - Offensive Information Operations; and
 - Integrating and synchronizing DOD’s role in Combating WMD.
2. We have made significant progress in several areas, for example:
 - a. We have fielded an initial ballistic missile defense capability at Ft. Greely, Alaska; and expanded international cooperation and participation in our missile defense program.
 - b. We are reducing U.S. nuclear forces to 1,700–2,200 operationally deployed strategic nuclear warheads by 2012. We are on-track to meet our interim goal of 3,800 warheads by 2007.
 - We removed the last Peacekeeper Intercontinental Ballistic Missile (ICBM) from its silo in September 2005;
 - We completed the conversion to Nuclear-Powered Cruise Missile Attack Submarines (SSGNs) of two of the four Nuclear-Powered Ballistic Missile Submarines (SSBNs) that are being retired from strategic service; and
 - We implemented a new plan for the nuclear stockpile that will cut the total number of active and inactive warheads nearly in half by 2012.
 - c. We also are making progress in developing non-kinetic strike capabilities and improving planning, intelligence, and command and control capabilities that are needed to integrate New Triad capabilities effectively.
3. There are, however, areas where we have made only limited progress; these include:
 - fielding prompt conventional capabilities for Global Strike;

- transforming a Cold War nuclear arsenal to meet new challenges; and
- revitalizing the nuclear infrastructure.

We are working to make greater progress in these three areas in order to realize the broad mix of capabilities called for by the NPR. Instead of the legacy Cold War strategic posture, with its reliance on high-yield, nuclear weapons delivered by ICBMs, SLBMs, and heavy bombers to deter the Soviet Union, we need to transform and strengthen our posture to enable us to tailor deterrence against the full spectrum of post-Cold War threats. This, in turn, will require delivering on new capabilities that are credible and useful in affecting the decisionmaking of potential adversaries, and are effective against high-value, strategic targets.

For example, in a regional crisis against an adversary armed with WMD, the credibility of our deterrent may turn on our ability to threaten highly-valued assets of importance to that state's leadership, while minimizing collateral damage. These assets may include WMD, missiles, command and control, or leadership bunkers protected in hard and deeply buried facilities. Conventional Global Strike capabilities are meant to augment the existing military options for holding such targets at risk, and expand the range of prompt, long-range strike options available to the President—currently limited to nuclear weapons. Thus, rather than rejecting deterrence, prompt, conventional Global Strike capabilities are intended to strengthen deterrence in the changed and evolving strategic environment.

As Secretary Rumsfeld emphasized in the Foreword to the NPR, our direction is designed to “improve our ability to deter attack,” while “reducing our dependence on nuclear weapons” to do so. The NPR does not reject deterrence in favor of “nuclear warfighting,” nor does it “lower the nuclear threshold.” By fielding a New Triad of capabilities that includes conventional Global Strike assets, and defenses, and a responsive infrastructure, we strengthen the overall credibility of our deterrent posture and maintain the nuclear threshold at an appropriately high level.

By placing greater emphasis on advanced non-nuclear and defensive capabilities, we seek to increase the credibility of our deterrent posture for many contingencies, while reducing the emphasis on nuclear weapons in our strategic posture. The broad array of New Triad capabilities can better assure our allies and friends that they should continue their reliance on the U.S. strategic deterrent—that they need not seek an alternative or independent nuclear capability for their security—thereby strengthening our alliances and supporting our nonproliferation goals. At the same time, the more flexible and capable strategic posture that the New Triad represents will help dissuade potential adversaries from investing in capabilities to challenge the United States, and help deter aggression.

While our national strategy calls for reduced reliance on nuclear weapons, these weapons will continue to play a critical role in the defense capabilities of the United States, its allies and friends. Nuclear weapons provide credible military options to deter a wide range of threats, including chemical, biological, radiological, and nuclear weapons, and large-scale conventional military forces. Nuclear weapons possess unique properties that give the United States options to hold at risk a wide variety of target classes—some of which cannot be held at risk in any other fashion. Nuclear weapons will retain a vital role in deterring WMD threats, assuring allies of U.S. security commitments, holding at risk an adversary's assets and capabilities that cannot be countered through non-nuclear means, and dissuading potential adversaries from developing large-scale nuclear or conventional threats.

To achieve that goal we need to sustain flexible and credible nuclear forces. Sustaining such a force will help mitigate the risks associated with the drawdown of nuclear forces, provide a broader range of options to the President, and offer the means necessary to tailor deterrence against a range of potential adversaries and circumstances.

However, to maintain a credible nuclear deterrent we need to transform the nuclear stockpile so that the weapons we retain are appropriate for the challenges and uncertainties we will face in the coming decades. What we need is not a smaller version of the Cold War-era nuclear stockpile; we need capabilities appropriate for 21st century threats.

To accomplish the transformation of our nuclear stockpile it will be necessary to restore the Nation's nuclear infrastructure. The National Nuclear Security Administration has a plan for revitalizing this essential leg of the New Triad. Revitalization is essential in order to assure the long-term safety and reliability of U.S. nuclear warheads, strengthen deterrence for the new security environment, and provide a hedge against an unforeseen, catastrophic technical failure of any element of the nuclear force, or adverse geopolitical changes.

To assist in transforming the composition of the nuclear stockpile, and to help place the Nation's nuclear infrastructure on a sound footing, it is imperative that we continue, without delay, to field a Reliable Replacement Warhead (RRW). The

purpose of the RRW program is to ensure the long-term sustainability of a nuclear weapon stockpile for U.S. national security by, among other things, eliminating hazardous materials, and simplifying warhead manufacturing—all without nuclear testing. If successful, RRW may enable further reductions in the size of the stockpile by demonstrating a real capability to manufacture highly reliable, certified replacement warheads. In this respect, the RRW is a first step towards the responsive nuclear weapons infrastructure called for in the NPR.

III. THE QUADRENNIAL DEFENSE REVIEW

As noted earlier, DOD has periodically reviewed the fundamental assumptions of the NPR and subjected them to rigorous scrutiny. In the recent Quadrennial Defense Review (QDR), for example, senior civilian and military leaders reviewed several areas associated with the implementation of the NPR and development of the New Triad, and concluded that:

1. The U.S. needs to tailor its strategy of deterrence to each potential adversary;
2. The U.S. needs to make greater progress in fielding prompt, accurate, non-nuclear Global Strike capabilities; and
3. The U.S. can make further, modest reductions in the strategic nuclear force structure with minimal risk.

I would like to discuss each of these QDR conclusions in turn.

Tailored Deterrence

As I noted earlier, the U.S. needs to tailor its strategy of deterrence to each potential adversary across a wide range of scenarios. Tailored deterrence will require that we understand each potential adversary to a greater degree than in the past. We must constantly ask ourselves who we may need to deter, and what we may need to deter them from doing. It also means having the capability to create the specific and appropriate effects needed to influence the decisionmaking of each potential adversary. Together with transforming DOD operational capabilities, U.S. declaratory statements will also need to be tailored so that our policy statements and our operational capabilities work together to underpin our deterrence strategy.

Global Strike and the Conventional Trident Missile

As an element of a more tailored deterrent posture, the Department seeks to deploy, within 2 years, an initial capability to promptly engage targets globally with precision guided conventional weapons. This initial prompt Global Strike capability will be achieved by arming a small number of long-range Trident missiles with accurate, non-nuclear warheads. The rationale for focusing on ballistic missiles, in general, and on a non-nuclear Trident missile in particular, is that Conventional Trident represents a near-term, affordable, relatively off-the-shelf and low-risk option for providing the President of the United States with an important, new capability. By deploying SSBNs armed with Conventional Trident missiles we will close a long-standing gap in our strike capability for engaging an adversary promptly and precisely, any where in the world, without having to resort to nuclear weapons.

I understand that there is a concern about the possibility that the operational launch of a non-nuclear Trident missile might cause other nations, like China and Russia, to mistake it for a nuclear attack. The U.S. has employed dual-role weapon systems for many years, but we recognize that a non-nuclear Trident missile aboard an SSBN will represent a significant new development. I should point out that, for the near-term, only Russia will have the ability to both detect and respond promptly to ballistic missile launches. Fortunately, we already have in place links between U.S. senior leaders and their Russian and Chinese counterparts.

To mitigate the risk of misperception we are exploring a variety of additional transparency and confidence-building measures. These measures include advance notification and military-to-military talks so that others understand our concept of operation for this new capability. We are also exploring the proper command and control procedures and release authority issues associated with deploying SSBNs with conventionally-armed Trident missiles. Our experience with hundreds of at-sea test launches over the past four decades, without incident, demonstrates that appropriate transparency measures can greatly reduce the potential for misunderstanding. We believe the benefits to be gained from Conventional Trident are important and the potential risks manageable.

In this context, it is important to remember that while every military action involves risks, there may also be risks—and sometimes regrets—in not acting. By developing and deploying a Conventional Trident we will provide the President with one more option with which to defend against threats to the United States.

We also are studying other, longer-term solutions, both sea- and land-based, in order to broaden our portfolio of non-nuclear Global Strike capabilities and provide even greater flexibility in our strategic posture. The initiatives underway include assessing options for kinetic and non-kinetic non-nuclear capabilities. For example, the Air Force's Land Based Strategic Deterrent Analysis of Alternatives study is seeking to identify a cost-effective set of global strike solutions; the Army is studying a concept for fielding an Advanced Hypersonic Weapon; and the Navy is studying the development of a conventionally-armed Submarine Launched Ballistic Missile with a range of about 1,500 nautical miles to increase the versatility of the cruise missile-armed submarine (SSGN). In addition, there are other initiatives underway across DOD that support the Prompt Global Strike mission; these include major enabling capabilities such as the transition to a net-centric based command, control, communications architecture, and improved global situation awareness with enhanced intelligence, surveillance, and reconnaissance tools.

Further Reductions in the ICBM Force

As I noted earlier, we have made considerable progress to date in drawing down our operationally-deployed strategic nuclear weapons to the 1,700–2,200 level; this includes the withdrawal of all 50 Peacekeeper ICBMs from their silos, and the withdrawal of 4 SSBNs from strategic service and conversion to SSGNs. In light of our progress in making these reductions and fielding New Triad capabilities, the QDR re-evaluated our strategic nuclear force posture. As a result, DOD's senior leaders determined that—with minimal risk—we could make a further, modest reduction in the number of nuclear-armed ICBMs by retiring 50 Minuteman IIIs. This represents a 10-percent reduction in the size of the Minuteman III force as envisioned by the NPR in 2001, but it will not affect the number of operationally deployed strategic nuclear warheads we are planning to deploy by 2012.

IV. CONCLUDING REMARKS

A sustained partnership between the DOD and Congress will be needed if we are to succeed in transforming our Nation's strategic capabilities to meet the uncertainties and challenges ahead. The Department will require your continued support to replace the legacy Cold War force posture with a New Triad that is better suited to the new security environment. In closing, I would like to summarize my main points.

1. Conventional Trident Missile is a near-term means of addressing the current lack of capability for prompt, conventional Global Strike. The longer-term goal is to develop a range of prompt Global Strike capabilities that can provide the President with a wider range of options for addressing the dangers of the new security environment.
2. Continued progress on ballistic missile defense is essential. The Department has made great strides since the President's decision in 2002 to field missile defenses, and we appreciate the continued support of this committee as we field this important capability.
3. Transformation of the nuclear force is not only a matter of making reductions in operationally deployed strategic nuclear weapons. Making tailored deterrence a reality, and fielding a strategic force that is properly configured for the 21st century, will require us to make adjustments in our force posture, in our residual nuclear stockpile, and in our thinking.

Finally, as we transform U.S. strategic forces to deal with new security challenges, we must also rethink important issues and ideas—especially our understanding of deterrence. We cannot contend with 21st century uncertainties with a Cold War-force posture, a Cold War nuclear stockpile, or Cold War thinking.

Senator SESSIONS. Thank you, Secretary Flory. General Cartwright, we'd be pleased to hear your opening comments at this time.

**STATEMENT OF GEN. JAMES E. CARTWRIGHT, USMC,
COMMANDER, U.S. STRATEGIC COMMAND**

General CARTWRIGHT. Thank you, Mr. Chairman, Senator Nelson. I'm not going to go back over the threat and some of the things that I think have been very clearly laid out by Secretary Flory, but I would like to cover, starting with the Triad and the construct of the New Triad, the offense, defense, the infrastructure piece. Re-

member that this is underpinned by a robust command and control system, the intelligence, surveillance, and reconnaissance capabilities and the planning capabilities that allow the use of this Triad and the integration of its capabilities in a more holistic fashion than maybe has been the case in the past.

When you look at the Triad, the offensive piece, and that's what we're here to address today, a subset of the offensive piece is global strike, and that subset really is to hold at risk important targets such as those that are associated with WMD, missiles, command and control, hard and also the deeply-buried-type targets. These are the types of targets that we are focusing in on with global strike. A subset of global strike is the Prompt Global Strike, which really starts to get at the issue of those targets that will not necessarily emerge next to where we're based or where our normal patrol routes are. It can appear anywhere globally. It does not necessarily pay attention to borders or overfly rights and things like that, for which the significant regret factors of, say, a WMD or a type of target that represents a WMD—can cause great regret factors for the country. For these types of targets, we're trying to create a set of choices for the Nation on how to address them.

Today, we hold prompt global targets of this type at risk with our strategic or nuclear forces, and the question is, can we expand because of the advances that we have made in precision, because of the advances that we have made in command and control, because of the advances that we're making in our ISR intelligence capabilities. Are there a further set of opportunities that we can use to hold at risk. Not all of these targets will present themselves in a way that is necessarily appropriate for a nuclear weapon, and that's just the diversity of the threat, the realities of where we are moving in the world. A nuclear weapon is still a viable part of our inventory, but it is, as the Secretary said, one-size-does-not-fit-all. What we would like to do is create an opportunity here to field a weapon that will give us a broader and potentially more appropriate choice for the Nation.

In looking at the construct of 24 of these weapons, 2 per boat across the population, the intent here is to provide a credible choice that will hold these unanticipated targets, these fleeting targets, targets that don't stay in one place for very long, don't give us a lot of indications and warning that they're going to be there, to hold them at risk in a way that we have not been able to do in the past with something other than a nuclear weapon. We are asking to proceed on a path that will field on the Trident missile a conventional warhead. This warhead, by the way, is not explosive. It is inert. Because of the energy that is associated with a Trident reentry vehicle, the explosive, at least for this initial capability, is not necessary, given the precision that we believe that we can obtain.

I think that it's important to understand that over the next 2 years, as we field this initial capability, the command and control, the planning, the supporting ISR structure will be developed along with the capability, and we are working now to realize those gains. Included will be the surety measures, the assurance that we are launching the right weapon at the right target 100 percent of the time from the submarine. The political and the military dialogue

between governments that must occur so that we understand what it is we're trying to accomplish here, how we're going to use it, how it's going to appear to the adversary and to allies and friends or disinterested parties, if they are just merely watching, how this will look.

These are critical. This will be accomplished through tests, through exercises, through mil-to-mil dialogue, political dialogue. All of these things are absolutely critical to demonstrate clearly the capability. You'll also note that in this dialogue, we have chosen to do this in an unclassified form. This is an open hearing. We are talking about this because it is important to have transparency in what we want to do in the future in this capability, to not leave ambiguity in the equation.

This is not a new capability. Since 1968, we have launched 433 of these warheads on these missiles without ambiguity through notification processes, talking to the Russians and the Chinese. You can imagine that in a period since 1968, with 433 plus launches, that we have had bad weather days, we have had maintenance, we have had issues. The system that is in place to keep people informed about what we are doing has worked well for us, and we will continue to improve that system and improve the dialogue through training and exercises. This conventional Prompt Global Strike capability will be a credible choice that will offer the Nation a broader set of tools to confront the enemies that we face today and in the future, and we believe it's essential to offer this choice to the Nation.

Let me go back and pick up just a couple of the questions that Senator Nelson highlighted. The Minuteman reductions from 500 to 450. The dialogue there is an acknowledgment that we would like this system to last well into the future, and we have expectations on the life of the system. We have to match that with test assets to ensure that as the system ages, we understand the character of that aging, that we know what to expect out of that system, given that it carries the weapons that we carry on our Minuteman system. We have to have surety in that system and only can do that through testing. We have to keep a robust test program all the way through the life of the program. When we looked at the three wings associated with the Minuteman, there is a wing of 150, a wing of 200, and a wing of 150. It just seemed to be logical that we would create three wings of 150, take the 50 assets, use them both for tests and also, to some extent, for R&D, we have money in this budget that is addressing the next generation system. We have to start looking at the risk reduction activities, the test activities that will allow us to understand where we want to go in the future. This is not a reduction in the number of warheads deployed. They will just merely be redistributed on the missiles. So, there is not a reduction in warheads. This is a reduction in the number of launch vehicles, and it allows us to move forward into the future.

Senator SESSIONS. Probably not, it would be multiple warheads?

General CARTWRIGHT. Right now, we're at a strategy that would put 500 on 500, so one warhead each. Now 50 of the missiles will have more than one warhead, and that would still leave us with the ability to say that our crystal ball wasn't perfect. We may find in the future that we have an adversary that emerges. It still

leaves empty slots and the capability to quickly reconfigure appropriately for the adversaries that we might face in the future that we didn't anticipate. So it leaves flexibility to understand that we don't know everything we need to know about the future.

On the cruise missile side of the equation, and Senator, I believe you referred to the cruise missile study and the tension that that causes with the desire to move forward on the RRW. The study is essentially complete. We jointly, inside the DOD, between policy and USSTRATCOM, have worked that study. It's in the briefing phase. It will move it up through the decision process. We understand the desire. There is only so much resource out there. That resource is not only the dollars, but it's also the intellectual capital associated with the labs, it is the production capacity associated with the labs. There are a lot of resources tied up in a smart and quick decision, but there is also the consideration of the risks associated with moving from one capability to the next, should we decide that, or retaining a capability to ensure that we have that into the future. We're trying to capture all of that, do it as quickly as we can and make sure that we are well-informed before we announce that decision, and that will be something that will be brought up through the Department.

The last question I think that you brought up, that I'll quickly address, is the question on the B-52s and the number of B-52s. You'll also note in this budget the resources associated with and the acceleration of the next generation of bomber. We think that that's important. We think it's important to start to accelerate that capability. There are several attributes that are being discussed as we look at the next generation capability. Certainly survivability has always been a big issue, but also the difference between prompt—which means something that goes fast and gets there quickly, versus something that can get out there and have long loiter and be able to stay and persist with large payloads on station—understanding the tradeoffs associated with that. Are we dealing with one asset, are we dealing with a family, how do we bring those attributes to a common platform, what's the right balance between that platform and the ballistic missile family that we're fielding and will field in the next generation? Those are all the things that are being discussed as we work our way through this.

Again, there are limited resources. We are starting to move in a direction that would free up the resources to accelerate the fielding of the next generation bomber. I think it still puts us, from a USSTRATCOM perspective, with sufficient bombers to exercise those missions that have been assigned to USSTRATCOM for the bombers, both in the B-2 and the B-52.

I'll stand ready for your questions, sir.

[The prepared statement of General Cartwright follows:]

PREPARED STATEMENT BY GEN. JAMES E. CARTWRIGHT, USMC

Mr. Chairman and members of the subcommittee: Thank you for this opportunity to review U.S. Strategic Command's (USSTRATCOM) progress during the past year and to present our plan for the future. I will discuss the Quadrennial Defense Review (QDR) role in validating and updating our transformational approach, and request your continued support for specific actions necessary to ensure our strategic capabilities are correctly postured to meet the challenges of today and tomorrow. 2006 is a year of unprecedented change. Our ultimate goals are driving the pace

of change: building strategic advantage, ensuring the security of the American people and strengthening the community of free nations.

ADAPTING TO THE NEW ENVIRONMENT—TRANSFORMING WHILE WE FIGHT

One year ago, we spoke of global interdependence and its impact on how we organize, plan and operate. We emphasized developing strong links between U.S. strategic objectives and regional operations, as our adversaries were employing asymmetric means to strike well beyond the battlefields of Iraq and Afghanistan. We also spoke of USSTRATCOM's new mission assignments and the steps we had undertaken to transform our command into an agile 21st century organization capable of deterring our adversaries and bringing the full range of global strike, defensive, command and control (C2), and intelligence, surveillance, and reconnaissance (ISR) capabilities to bear against them if necessary. We outlined an enormous transformational effort that had to be accomplished in the context of an ongoing global conflict with active combat operations and without the luxury of an operational pause.

Throughout the last year, the men and women of USSTRATCOM have engaged in that global conflict, often employing means not visible either to the average American or to our adversaries. They met this day-to-day challenge with professionalism and commitment while they were also restructuring our organization to focus our efforts, conserve our resources, and streamline support to other combatant commanders around the world. I come to you today gratified by the progress these fine men and women have made and energized to complete the task before us.

USSTRATCOM TRANSFORMATION VECTORS

The Department of Defense (DOD) budget you enacted for 2006 enabled a string of organizational and operational successes along all of our transformation vectors.

We changed the way we are organized and operate. We implemented, and by the end of 2006 will refine, the redistributed and functionally aligned command structure described last year. This new structure is already paying off in terms of decentralized operational employment and increased operational speed. Our efforts resulted in:

- A flattened, streamlined, and focused headquarters staff charged with maintaining command and control of the Nation's nuclear forces, providing strategic guidance and advocacy for essential mission capabilities, and conducting integrated and synchronized strategic-level planning necessary for mission accomplishment in all mission areas.
- Four interdependent Joint Functional Component Commands (JFCCs): Intelligence, Surveillance and Reconnaissance (ISR); Network-Warfare (NW); Integrated Missile Defense (IMD) and Space and Global Strike (S&GS). Day-to-day operational planning and execution of specialized global capabilities now reside at the component level, where commanders are able to maintain focus on their primary mission and not be distracted by staff support activities.
- Integrated Information Operations (IO) support through the Joint Information Operations Center (JIOC). The JIOC is the focal point for all operational and tactical IO planning support to DOD users around the globe.
- Improved security for DOD information systems through the aggressive efforts of Joint Task Force—Global Network Operations (JTF—GNO). JTF—GNO instituted stringent use controls and trained system users to reduce vulnerabilities.
- A collaborative, Joint Space Operations Center (JSpOC), to deliver select DOD space capability to U.S., Allied, and other national users. When fully operational, JSpOC will provide the full range of DOD space capabilities.
- A new USSTRATCOM Center for Combating Weapons of Mass Destruction (SCC—WMD) and a new Global Innovation and Strategy Center (GISC) that recently completed their formative processes, joining the fight with specialized technical skills and solutions to unique mission challenges.

By making this unique organizational transformation we also strengthened our operational relationships with the Defense Intelligence Agency (DIA), Defense Threat Reduction Agency (DTRA), Defense Information Systems Agency (DISA), and National Security Agency (NSA) in order to leverage the tremendous resources and capabilities resident in these organizations. Now we effectively bridge many artificial barriers to communications and information sharing, and bring enhanced combat power to the regional combatant commanders.

We made progress in our drive toward a New Triad of capabilities. The New Triad is comprised of offensive and defensive capabilities enabled by persistent global com-

mand and control (C2), intelligence, an agile planning system, and a responsive defense infrastructure. The New Triad provides improved flexibility in dealing with a wider range of contingencies, while reducing our dependence on nuclear weapons, in order to assure our allies, dissuade competitors, and deter those who plan to harm us, particularly with WMD.

Efforts to improve conventional global strike capability focused on generating effects without being hindered by factors of time, distance, basing rights, over-flight considerations or undue risk to American service men and women. Recently the Department:

- Bolstered the number of Joint Direct Attack Munitions (JDAM) in the inventory, providing all weather, precision strike in a smaller weapon footprint.
- Fielded Tactical Tomahawk (TACTCOM) and the Joint Air to Surface Stand-off Missile (JASSM), providing strike weapons that operate from ranges outside enemy point defenses.

During the past year non-kinetic capabilities became an increasingly important tool to deny our adversaries the opportunity to communicate easily or to manipulate information in ways that further their efforts to undermine stability around the world. We seek better non-kinetic capabilities to improve our freedom of action at the lowest level of conflict; to enhance deterrence; and support the sustained ability to use our networks while denying the adversary a similar capability. In this area we:

- Expanded development of the applicable tactics, techniques, and procedures to support use of information and networks—cyberspace—as an environment for integrated exploitation, offensive, and defensive operations.
- Improved integration of non-kinetic effects into operational planning, on a limited basis, in support of forces involved in the global war on terrorism.

The President has committed the United States to sustaining a credible nuclear deterrence capability with the lowest possible number of nuclear weapons consistent with national security. USSTRATCOM's task is to ensure our nuclear force remains ready to meet any contingency while the nuclear stockpile remains safe, secure, and reliable as we prudently achieve the thresholds specified in the Moscow Treaty. To this end we:

- Sustained a safe and reliable nuclear stockpile in cooperation with the National laboratories and the National Nuclear Security Administration (NNSA).
- Took steps to improve the security and safety of the deployed nuclear force.
- Retired the last Peacekeeper Inter-Continental Ballistic Missiles (ICBM) from service.
- Reduced the number of operationally deployed strategic nuclear warheads on the Minuteman III ICBM force.
- Transferred the final ballistic missile submarine scheduled for reconfiguration to carry conventionally armed cruise missiles.

We continued pursuit of both active and passive defenses as a means of deterring our adversaries by demonstrating our ability to deny their attempts to coerce or harm the United States. During 2006 we will:

- Conduct additional tests of a Standard Missile 3 (SM3), which is designed to engage mid and short range ballistic missiles early in flight.
- Conduct tests of a Terminal High Altitude Area Defense (THAAD) missile, which is designed to engage mid to short-range ballistic missiles late in flight.
- Increase the number of emplaced Ground-Based Interceptors (GBIs) in Alaska and California. GBIs are designed to engage long-range ballistic missiles in the midcourse of their flight. We plan on an interceptor demonstration this spring and up to two more interceptor tests by the end of 2006.
- Refine our missile engagement tracking capability by deploying sea-based and forward-based X-Band radars to operational locations in the Pacific region, where, by the end of 2006, they will join a global network of radars.
- Upgrade the Command, Control, Battle Management, and Communications System (C2BMC) to extend situational awareness capability to Pacific Command and European Command by the end of 2006.
- Promote expanded interagency support and participation in the Proliferation Security Initiative to further global efforts to combat the spread of WMD.

At the heart of the New Triad are the key enablers of command and control, intelligence, and planning. Through these enablers, and our broad array of space capability, we create the agility to respond to a wide range of global challenges. During 2006 we will:

- Evolve the renovated USSTRATCOM Global Operations Center to enhance collaboration among all geographically distributed USSTRATCOM elements—defining the first step toward a Global C2 capability for all New Triad forces.
- Complete preparations for opening the first node in a network of ground entry points designed to serve a nationally distributed ground, air and sea network capable of providing the diverse connectivity requirements of the New Triad and DOD support to a broader national command capability using all elements of national power.
- Codify the output of the department-wide process review designed to modify historically inefficient ISR force apportionment practices to globally manage low-density, high-demand ISR assets such as unmanned aerial vehicles and reconnaissance aircraft.
- Extrapolate the results of an exercise in which we demonstrated the ability to achieve persistence through the combination/integration of different intelligence, surveillance, and reconnaissance (ISR) phenomenology, to better fulfill combatant commander's intelligence requirements.
- Capitalize on the longer dwell time of unmanned and unattended sensors to produce greater persistence in global war on terrorism operations.
- Initiate a pilot program to determine essential global strike command and control services with an explicit objective of delivering a distributed, collaborative product. The pilot program will take advantage of the Department's Data Strategy, which calls for visible, accessible and understandable data, and uses Services Oriented Architectures (SOA) to promote flexibility and agility.
- Initiate efforts to transition from a limited space surveillance architecture to a more fully integrated terrestrial and space-based approach to situational awareness.

A NATION AT WAR—CONTINUING TO TRANSFORM

When I came before you last year, it was clear the pace of change and nature of the threats and challenges to our Nation were growing rapidly. It was also clear that USSTRATCOM's legacy systems and organizational relationships were not suitable for meeting emerging challenges the Nation now faces. Our intent, this year, was to address nuclear issues in the QDR in order to rationalize them in the context of our overall capabilities. It is against this backdrop that we entered the dialog of the 2006 QDR.

USSTRATCOM presented new ideas and concepts, which were widely debated during the course of review proceedings. We entered this review believing the New Triad concept was sound in principle, but that the pace of attaining the new construct was lagging the national need. With this in mind we focused on four objectives:

- Determine which elements of our considerable nuclear force structure are essential to future stability and which might be retired in favor of more redundant and credible conventional or non-kinetic capabilities called for by the 2001 Nuclear Posture Review (NPR) and 2005 Strategic Capabilities Assessment.
- Determine the next steps needed to fulfill our commitment to an integrated missile defense capable of defending the U.S., its deployed forces, friends, and allies.
- Identify key enablers within the domains of intelligence, surveillance, and reconnaissance; communications, space, and collaborative planning that could rapidly improve our agility and responsiveness.
- Identify structural barriers to effective integration and synchronization of DOD efforts to combat weapons of mass destruction.

The QDR served to remind us of two very important factors: first, that the United States is a nation engaged in a long war; and second, that our enemies in this long war seek weapons of mass destruction and will likely attempt to use them in their conflict with free people everywhere. Importantly, the QDR validated the need to adjust the U.S. global military force posture by moving away from a static defense in obsolete Cold War garrisons. While the review described many areas in which we must shift emphasis, we believe three are of particular importance to shaping our command and its approach to the future:

- From nation-state threats—to decentralized networked threats from non-state enemies.
- From “one size fits all” deterrence—to tailored deterrence for rogue powers, terrorist networks, and near-peer competitors.
- From a focus on kinetics—to a focus on effects.

We have taken the QDR’s imperative for change as validation of our desire to accelerate transformation in many areas. While we believe progress has been made, more can be done in selected areas to improve USSTRATCOM’s posture and preparedness to respond to a wider range of traditional, irregular, disruptive, or catastrophic challenges. Beginning in 2007 we will take steps to:

Improve USSTRATCOM’s nuclear deterrence posture. Key initiatives include:

- Reduce the number of deployed Minuteman III ballistic missiles in order to provide assets to meet essential flight test needs and ensure the viability of the Minuteman force. This will better balance our legacy nuclear capabilities while preserving our ability to reconstitute additional forces in response to strategic surprise.
- Study the requirement for a Minuteman III replacement. We believe this is an essential step toward ensuring our future national security needs.
- Study the requirement for nuclear-armed cruise missiles and look at alternative methods of storing these Cold War era weapons. We believe that this study will provide valuable input in support of developing an effective long term strategy to maintain the nuclear stockpile.

Develop a wider range of conventional deterrent weapons. USSTRATCOM championed the need for a prompt, precise conventional global strike capability, to bridge the gap between prompt nuclear weapons and less timely, but precise, conventional weapons. Key initiatives include:

- Deploy an initial precision-guided conventional Trident Sea-Launched Ballistic Missile capability within 2 years. The speed and range advantage of a conventional Trident missile increases decision time and provides an alternative to nuclear weapon use against fleeting, high value targets. The conventional Trident missile would be particularly useful in deterring or defeating those who seek to coerce or threaten the U.S. with WMD.
- Develop a new land-based, penetrating long-range strike capability to be fielded by 2018.
- Study alternative options for delivering prompt, precise conventional warheads using advanced technologies such as hypersonic vehicles from land, air, or the sea.

Develop non-kinetic capabilities to expand the range of effects we can generate against certain targets. Without question we are on the verge of a major technology shift to the Network Age. We see an environment in which digital internet communication is more pervasive, reliable, efficient, cheap, and rapid—even with the enormous increase in volume, variety, and velocity of data. Key initiatives include:

- Develop capabilities that promote the freedom of action we enjoy in other mediums like, maritime and air.
- Develop the doctrine, organization, training, maintenance, logistics, personnel and facilities to defend our Nation in this domain.
- Enhance measures to improve information assurance and network security.

Improve integrated defenses against short, intermediate, and intercontinental range ballistic and cruise missiles, and develop complementary capabilities to combat weapons of mass destruction. Key initiatives include:

- Develop and mature integrated air and missile defenses that deter attacks, demonstrating the ability to deny an adversary’s objectives.
- Integrate defensive systems among our international partners in ways that promote assurance against attack.
- Expand the Army’s 20th Support Command’s capabilities, to enable it to serve as a Joint Task Force capable of rapid deployment in support of WMD elimination.
- Improve and expand U.S. forces’ capabilities to locate, track and tag shipments of WMD.
- Expand our advanced technical render safe capacity and implement measures to increase associated speed of response.

Improve our nuclear infrastructure. USSTRATCOM recognizes the importance of an efficient and more responsive nuclear weapons infrastructure to the Department’s strategy of tailored deterrence. We believe this is the essential element needed to ensure our weapons are safe, secure, and reliable, to ensure we can respond

to both technological and political surprise, and to reduce our current stockpile of nuclear warheads.

In May 2005, the Nuclear Weapons Council commissioned an 18-month study, to determine the feasibility of replacing some W76 warheads with a Reliable Replacement Warhead (RRW) and to examine the potential for using RRW in lieu of the W78 warhead. This U.S. Navy led study will include Air Force and Interagency participants and should issue a final report in November 2006. We believe this study will be a useful tool in addressing some of the concerns raised by the Report of the Defense Science Board Task Force on Nuclear Capabilities, dated January 2006. The key initiative is to:

- Determine the feasibility of replacing existing warheads with a RRW.

Develop a more coherent global command and control capability and a network-enabled architecture that moves information to the user, rather than moving the user to the information. The New Triad needs a robust, resilient global C2 system that builds on our legacy nuclear C2 system and serves as the basis of a critical national-level capability suitable for use in emergencies range from terrorist attacks to natural disasters. Key initiatives include:

- Transition the USSTRATCOM Mobile Consolidated Command Center, providing a survivable and enduring nuclear command and control capability, to a new network of distributed ground-based communications nodes; establishing a gateway to a robust multi-functional global command and control capability.
- Retire four National Airborne Operations Center (NAOC) and upgrade the TACAMO command and control aircraft, to sustain a survivable airborne link to strategic nuclear forces and broaden our ability to support full functionality of the New Triad.

Transition intelligence, surveillance, and reconnaissance activities from a legacy approach, directed largely at monitoring nation states in two theaters, to a true global enterprise tailored to meet regional needs. Key initiatives include:

- Implement a new global intelligence approach focused on achieving persistent collection capabilities against legacy and emerging threats, with our U.S. Government and allied partners, and improved synergy with the Intelligence Community.
- Increase investment in unmanned aerial vehicles (UAVs) to provide greater dwell capabilities in the effort to identify and track mobile targets globally.

Improve space capabilities. The space mission area creates a decisive strategic advantage for our National security, empowering critical economic as well as defense related activities. Our dependence on space capabilities, coupled with recent significant advances in space operations demonstrated by others, establishes a true imperative to protect our space assets and our freedom of action in space. STRACTOM understands the need to stay at least one technology generation ahead of any foreign or commercial space power. We must improve space situational awareness and protection, and ensure unfettered, reliable, and secure access to space. Key initiatives include:

- Improve responsive space access, satellite operations, and other space enabling capabilities such as the space professional cadre.
- Integrate air and space capabilities to deliver combined effects.
- Realign resources to sustain existing space surveillance capabilities.

USSTRATCOM REQUESTS YOUR SUPPORT TO MEET THE CHALLENGES WE FACE

Over the next 5 years, we must fully transform while remaining engaged in a conflict in which our enemies will use any and all means to achieve their objectives. We believe a more aggressive transformation schedule than envisioned 5 years ago is essential to maintain the strategic advantage needed to deter or defeat those who would do us harm. If we do not accelerate this transition, we will face these adversaries, who attack through asymmetric means, with the blunt weapons of last resort that won the Cold War. That alone will not preserve our future national security. In particular we are requesting your support in the following areas:

Prompt, Precision Conventional Global Strike

Tailored deterrence requires a more complete range of capabilities to address the wide spectrum of challenges that confront us today. While the Department employs expeditionary forces around the globe, it is unlikely we will have forces in every place we need them at the crucial moment when we have an opportunity to stop a WMD-armed threat far from our shores. The United States has the capability to

engage with high quality conventional forces around the world, given days or perhaps weeks to respond. But if our general-purpose forces are not in a position to respond rapidly, the need to defeat attacks against the United States may require USSTRATCOM to interdict fleeting targets at global range. We have the delivery capability on alert today, but configured only with nuclear weapons. This choice is not credible against many of the extremist adversaries we will face.

We recommend proceeding with development of the responsive, conventional global strike alternative offered by the Conventional Trident Modification (CTM). The President's budget request includes funds for the modification of a number of submarine based Trident Missiles to deliver conventional warheads with precision over thousands of miles in tens of minutes.

Global Command and Control (GC2)

We are now faced with the task of recapitalizing our aging, Nuclear Command and Control (NC2) network, which is a matter of prime importance. Capitalizing on advances in technology, we envision a transition from the single-purpose, stove-piped NC2 network that served us during the Cold War, to a multi-functional, distributed, survivable, and expandable Global Command and Control capability, leveraging the assets and resources of the Global Information Grid and serving the needs of our joint warfighters.

With your support for the President's budget request, we can deliver a resilient air, land, and maritime GC2 capability that will tie together all elements of New Triad power. Fully developed, the GC2 will enable collaboration between, and among, DOD and other government agencies and partners, providing the core of a National Command Capability to meet the broadening array of potential challenges we face as a nation. A true National Command Capability will only be effective with federally mandated standards for data tagging to facilitate enhanced information sharing.

Reliable Replacement Warhead

Finally, if we are to break the cycle of maintaining and refurbishing large numbers of Cold War-era nuclear warheads to guard against uncertainty, we request your support to ensure a safe, secure, reliable nuclear stockpile, and in the process transform the nuclear weapons enterprise. Discussions over the past year within the executive branch and Congress have increased understanding of the role for nuclear weapons in our current environment, and the value of a responsive defense infrastructure. USSTRATCOM supports the RRW as the key to transforming our aging Cold War nuclear weapons stockpile. RRW will enhance our long-term confidence in the stockpile and reduce the need to retain high numbers of hedge weapons while exercising the people, science, technology base and facilities required for sustaining the nuclear weapons enterprise.

Maintaining the current stockpile of Cold War era weapons is a challenge. If directed, we believe the time is right; the risk is manageable; and the opportunity is at hand to choose weapons that will best serve our future and allow us to further reduce our overall stockpile size, in order to transition to and maintain a smaller but safer, more secure, and more reliable nuclear weapon arsenal.

USSTRATCOM TRANSFORMATIONAL VECTORS BUILDING STRATEGIC ADVANTAGE

USSTRATCOM plays an important role in leading national efforts to send an unambiguous message to our adversaries and friends alike—we will do whatever it takes, for as long as it takes, to ensure the forces of freedom possess a lasting strategic advantage against those who would deny citizens of America and the world the security to govern their own future. We will continue to be aggressive and resourceful in offering our best advice in the pursuit of capabilities needed to meet our National security requirements. With your help we can assure our allies, dissuade unhealthy competition, deter coercive or damaging acts, and above all else, defend our citizens and defeat our enemies. Thank you for your continued support.

Senator SESSIONS. Thank you.
Admiral Young.

STATEMENT OF RADM CHARLES B. YOUNG, USN, DIRECTOR, STRATEGIC SYSTEMS PROGRAMS

Admiral YOUNG. Good afternoon, Senators. I do not have an opening comment. I have submitted a statement for the record, and I stand by to answer your questions.

[The prepared statement of Admiral Young follows:]

PREPARED STATEMENT BY RADM CHARLES B. YOUNG, USN

INTRODUCTION

Chairman Sessions, Senator Nelson, and distinguished members of the Strategic Forces Subcommittee, thank you for the opportunity to testify regarding Navy's role in Global Strike.

The hierarchy of policy documentation that reflects our National strategy identifies the need for precise Global Strike. The President's National Security Strategy (NSS) directs an active approach toward countering transnational terrorist networks, rogue nations and aggressive states that possess or are working to gain weapons of mass destruction or effect (WMD/E). The National Defense Strategy further charges the Department of Defense (DOD) to secure the United States from direct attack, and to counter, at a safe distance, those who seek to use WMD/E against us. To deter or otherwise prevent such an attack against the United States, its allies or its interests, our National Military Strategy emphasizes the need for rapid and accurate Global Strike, by both nuclear and conventional means.

THE 2006 QUADRENNIAL DEFENSE REVIEW

In accordance with the aforementioned strategic policy, the 2006 Quadrennial Defense Review (QDR 06) further explored the requirement for Global Strike.

In particular, QDR 06 detailed the need for a Joint Maritime Force capable of "conventional Global Strikes against time-sensitive targets . . . to counter political anti-access and irregular warfare challenges." Today's Navy provides this capability via flexible, forward-deployed assets such as Carrier Strike Groups, Expeditionary Strike Groups, and Guided Missile Submarines (SSGN). Yet among the key proposals made by QDR 06 was a refinement of our existing maritime capability to include "a wider range of conventional and non-kinetic deterrent options." Specifically, QDR 06 proposed that a number of TRIDENT submarine-launched ballistic missiles be converted for use in conventional Global Strike.

CONVENTIONAL TRIDENT MODIFICATION

Conventional TRIDENT Modification (CTM) adapts the TRIDENT II (D-5) missile system to deliver conventional (non-nuclear) effects at global ranges. The TRIDENT Weapon System and the D-5 missile are well suited for this role by virtue of the long range and payload capacity of the D-5 missile, and the responsiveness and survivability of the TRIDENT weapon system. Responsive, survivable and persistent, CTM will defeat a diverse set of unpredictable threats without visible presence or risk to U.S. forces, and with little or no warning prior to strike. CTM implements the New Triad envisioned by the Nuclear Posture Review, and is an evolution of deterrence toward conventional weapons. CTM CONOPS are currently under development at U.S. Strategic Command (USSTRATCOM).

CTM will use existing D-5 missiles, MK4 reentry bodies equipped with aerodynamic controls, GPS-aided terminal guidance, and a conventional warhead. Advanced error-correcting reentry vehicles with GPS-aided Inertial Navigation Systems have been flight proven in a previous D-5 test program. Total time from decision to weapons-on-target is about 1 hour. CTM technology can be rapidly developed and deployed within 24 months. The total cost of the program, including operations, training, and support is \$503 million. The CTM program is fully funded, with \$127 million budgeted in fiscal year 2007 and \$376 million budgeted through fiscal year 2010. The CTM program will leverage existing D5 investment and infrastructure to minimize risk to operations, training and support funding.

FURTHER NAVY INVESTMENT

In addition to proposing a conventional Global Strike option, QDR 06 called for the continued maintenance of our existing nuclear capability. Navy has several initiatives underway toward this end.

TRIDENT II D-5LE Program

TRIDENT II (D-5) Submarine Launched Ballistic Missile Life Extension (LE) program will redesign and replace aging missile electronics and guidance systems. Under this program, 108 additional missiles will be procured in order to meet long-term inventory requirements associated with the life extension of the *Ohio* class Nuclear-Powered Ballistic Missile Submarine (SSBN) from 30 to 45 years. Redesign of missile electronics and guidance components is in progress, and procurement of new

D-5 LE missiles begins in fiscal year 2008. The TRIDENT II (D-5) missile has been operational since 1990, providing the backbone of America's strategic deterrence. The low-rate production continuity procurement strategy has been extensively reviewed and approved by DOD and the Congress, and has been in execution for nearly 15 years. This procurement strategy has proven successful, based on the demonstrated performance of the TRIDENT II D-5 weapon system. The Navy submitted a report to Congress in December 2002 that detailed the impact of alternative full-funded procurement strategies and recommended continuation of current production. Continued production of critical components represents the best balance of cost and risk to extend the life of the D-5 missile.

Tomahawk Cruise Missile

There are currently four variants of the Tomahawk Cruise Missile in inventory—the Block II with a nuclear warhead, the Block III with either a conventional unitary warhead or sub-munitions payload, and the Block IV Tactical Tomahawk Missile (TACTOM) with the conventional unitary warhead. All four Tomahawk variants provide all weather long-range precision strike capability, supporting Sea Strike as an enabler of Carrier and Expeditionary Strike Groups. The Block IV TACTOM provides greater flexibility and responsiveness, at significantly reduced life cycle cost, than previous Tomahawk variants. Significant Block IV upgrades include flex targeting (with up to 15 pre-planned aim points loaded prior to launch), in-flight retargeting, launch platform mission planning, and a two-way ultra-high frequency (UHF) satellite communications data link. The Tomahawk Block IV is currently in full rate production and the Navy is committed to supporting the Tomahawk Weapon System program. The fiscal year 2007 budget request supports continued procurement of this deep-strike weapon due to inventory reductions during Operation Iraqi Freedom (OIF)/Operation Enduring Freedom (OEF) combat operations. Tomahawk Cruise Missiles are currently being procured in a 5-year, multi-year contract that saves approximately 12 percent over annual procurement contacts.

SSGN Engineered Refueling Overhauls (EROs) and Conversions

The Nuclear-Powered Cruise Missile Attack Submarine (SSGN) project refuels, overhauls, and converts the four oldest *Ohio* class SSBNs to SSGNs. These SSGNs will provide a transformational warfighting capability, carrying up to 154 Tomahawk cruise missiles and supporting deployed special operating forces. The new SSGNs will also have enhanced communication and improved masts and antennas for network centric operations. The SSGN conversions are being executed via a public-private partnership with Naval Shipyards. The first SSGN conversion, the U.S.S. *Ohio* (SSGN-726), was delivered in December 2005 after 3 years in production. Future deliveries include the U.S.S. *Florida* (SSGN 728) in April 2006, the U.S.S. *Michigan* (SSGN 727) in December 2006, and the U.S.S. *Georgia* (SSGN 729) in September 2007.

SSBN Engineered Refueling Overhauls (EROs)

The *Ohio* class SSBN remains the backbone of USSTRATCOM's nuclear strike capability. Comprised of 14 TRIDENT II D-5 configured hulls, the *Ohio*-class SSBN remains the most survivable nuclear deterrent in the U.S. strategic arsenal. In keeping with the Secretary of Defense's Nuclear Posture Review, the U.S.S. *Alabama* (SSBN 731) began its ERO (in conjunction with TRIDENT C4 to D-5 conversion). In fiscal year 2007, the U.S.S. *Alaska* (SSBN 732) will begin its ERO at Norfolk Naval Shipyard (NNSY). The Navy will continue with SSBN EROs at the rate of 1 per year, alternating between NNSY and Puget Sound Naval Shipyard, in order to sustain our strategic deterrent capability well into the future.

INNOVATION

The Navy received an fiscal year 2006 congressional plus-up of \$7.2 million to demonstrate the feasibility of the Submarine Launched Intermediate Range Ballistic Missile (SLIRBM). Navy will use this money to fabricate one launch chamber and one prototype full-scale rocket motor, and to fund a subsequent test firing. Emphasis of this demonstration will be on affordability, defined as the combination of the lowest projected boost motor subsystem development cost, and the lowest possible expected average unit cost for a notional inventory of 100 missiles. This effort will demonstrate several innovative motor designs and manufacturing techniques in pursuit of an affordable SLIRBM system.

SUMMARY

Our national strategic policy identifies the requirement for a broad range of Global Strike capabilities. Due to its unrivaled access to the global commons, the Navy

is uniquely positioned to fulfill this requirement. In response to the need for conventional Global Strike, our CTM program is based on mature technologies and existing components. It is compliant with all arms control agreements, and can be developed and deployed within 24 months. Furthermore, we are redesigning and replacing aging missile systems and platforms in order to meet the long-term requirements of nuclear deterrence and Global Strike. In the meantime, Navy will continue to work closely with members of this subcommittee and Congress to refine our operational concepts and investments in order to deliver the dominant power our Nation expects. We look forward to our continued partnership in this endeavor.

Senator SESSIONS. Thank you very much.

General Gorenc.

STATEMENT OF MAJ. GEN. STANLEY GORENC, USAF, DIRECTOR, OPERATIONAL CAPABILITY REQUIREMENTS, DEPUTY CHIEF OF STAFF FOR AIR AND SPACE OPERATIONS, HEAD-QUARTERS

General GORENC. I'm the same way, actually. It's a pleasure to be here, and I look forward to answering your questions.

[The prepared statement of General Gorenc follows:]

PREPARED STATEMENT BY MAJ. GEN. STANLEY GORENC, USAF

INTRODUCTION

Thank you for the opportunity to discuss Air Force capabilities with respect to Global Strike. It is important to pay tribute to the airmen who are currently engaged in operations around the globe projecting the full range of air, space, and cyberspace operations as a part of a true joint and coalition team, multiplying the effectiveness of our partners by providing sovereign options for the defense of the United States of America and its global interests. We fly and we fight—whether we are flying A-10s over Afghanistan; F-16s over Iraq; communications satellites in geosynchronous orbit; piloting Unmanned Aerial Systems (UAS) patrolling Baghdad; or maintaining vigilance over our Nation's homeland in an airborne warning and control system aircraft. All airmen, no matter what their specialty, contribute to this mission. Today there are approximately 30,000 Active-Duty, Air National Guard, and Air Force Reserve airmen deployed around the world, many in harm's way. These brave men and woman are performing what we would say are traditional Air Force missions, such as providing close air support for ground operations and intelligence, surveillance, and reconnaissance from air and space-based systems, or nontraditional duties, like convoy operations, provincial reconstitution teams, military transition teams, detainee operations, protective service details, and the list goes on. Your Air Force today is deployed to over 100 forward operating locations touching all 7 continents. Our commitment to the combatant commanders extends well beyond airmen in the Central Command area of responsibility. We have nearly 210,000 airmen actively supporting combatant commander operations worldwide. These include nuclear alert operations, satellite operations, global airlift, worldwide tanker operations, and Homeland defense obligations of approximately 40-50 fighter aircraft, Airborne Warning and Control System (AWACS), and a dozen tankers on duty protecting our skies. Beyond that, we have another 195,000 airmen available for "Surge Operations," which are over and above planned deployments, the majority of these airmen are Guard and Reserve Forces.

MAINTAINING OUR NUCLEAR DETERRENT

The Department of Defense's (DOD) new strategy of employing a capability-based vs. threat-based approach to planning led to the ongoing transformation of the existing triad of U.S. strategic nuclear forces. The old Triad, consisting of intercontinental ballistic missiles, sea-launched ballistic missiles, and bomber aircraft armed with cruise missiles and gravity weapons; is transitioning to become part of a New Triad composed of a diverse portfolio of capabilities. Elements of this New Triad will include nuclear and non-nuclear strike capabilities, active and passive defenses, and robust research and development programs and industrial infrastructure for developing, building, and maintaining offensive and defensive weapon systems, all tied together with advanced command, control, computers, communications, intelligence, surveillance, and reconnaissance capabilities. Maintaining and modernizing our tra-

ditional nuclear strategic forces, at lower numbers is a key component in an effective New Triad.

The Minuteman III Intercontinental Ballistic Missile (ICBM), the backbone of our deterrent force, maintains its entire force on continuous alert. Elements of the Minuteman system were originally designed in the late 1950s and deployed operationally in October 1962; the Minuteman III was deployed beginning in 1975. Modernization programs have been crucial to this system, originally designed to last just 10 years. Service life extension programs, nine in all and well underway, ensure the ICBM force is reliable, survivable, safe, and secure through 2020 when the follow-on system, the Land-Based Strategic Deterrent (LBSD) becomes operational. Enhancements to LBSD will include improved accuracy, range, and security with a reduced cost of ownership.

The Quadrennial Defense Review (QDR) directed the Minuteman force be reduced from 500 to 450 beginning in fiscal year 2007. This reduction will maintain an effective, balanced nuclear force for worldwide deterrence. The Air Force is currently evaluating which 50 ICBMs will be deactivated. We estimate the cost of deactivation will be approximately \$19.5 million. Post deactivation, around fiscal year 2010, the Air Force estimates an approximate recurring savings of \$3.5 million. This figure does not include any manpower savings for the missile operators, maintainers, depot support and training personnel associated with the deactivation of a missile squadron, because these positions will be distributed elsewhere within the Air Force as part of rebalancing the Total Force.

The continuing advancements in conventional weapons capability, specifically increased precision and stand-off weapon ranges, will also allow us to reduce the Total Aircraft Inventory of B-52s from 76 to 56. The savings from these reductions will be utilized to fund the remaining bomber modernization effort, known as Phase One of the Long-Range Strike effort.

LONG-RANGE STRIKE

Our forces must be simultaneously responsive to multiple combatant commanders and be able to strike any point on the planet. To further refine our rapid strike capabilities, the Air Force is transitioning to a long-range strike strategy focusing on effects instead of platforms. We view long-range strike as the capability to achieve desired effects rapidly and persistently on any target set in any operational environment. The Air Force has a three-phased approach to meet the Nation's longrange strike requirements. Today, we provide deep strike capabilities through a variety of platforms and weapons. In Phase One, we will continue to modernize the legacy bomber fleet to upgrade, strengthen and increase their combat effectiveness. Phase Two, what we call the Next Generation Long-Range Strike effort, leverages near-term technologies to start development of a long-range strike capability that augments the current fleet around fiscal year 2018. In this phase, we will develop and field a Regional Strike capability or set of capabilities, with an emphasis on survivability and lethality improvements. Phase Three encompasses the development of advanced technologies today that will allow us to enable advances needed for the envisioned capabilities in fiscal year 2035. These future capabilities must combine speed, stealth, and payload to strike hardened, deeply buried, or mobile targets, deep in enemy territory, in an anti-access environment, in adverse weather and with survivable persistence.

PROMPT GLOBAL STRIKE

The New Triad requires the future force to provide a tailored and balanced deterrence capability that includes a wider range of conventional prompt, precise global strike systems more agile than current systems. This includes the ability to strike within hours, not days, any high value target, regardless of anti-access threats or denial of forward-based assets. To this end, United States Strategic Command and the Air Force have partnered to close the identified gaps with respect to this need. The effort is called Prompt Global Strike (PGS), and it can be accomplished in a variety of ways, through kinetic systems capable of placing conventional payloads precisely on target within minutes of release, to non-kinetic means, such as computer network attack. The initial capabilities document defining PGS was written in May 2005. On 16 February 2006 the Air Force Requirements for Operational Capability Council approved the PGS document. An analysis of alternatives will begin spring 2006.

CYBERSPACE

Assured, rapid delivery of information to the right warfighters is the foundation for all Air Force operations. Cyberspace is a logical extension of our core com-

petencies, enabling fast-moving effects across the spectrum of war nearly eliminating time and distance as obstacles. We must maintain our pre-eminence in cyberspace to ensure success in any future conflict. Preparing for the future, the Air Force is currently exploring innovative organizational constructs to ensure unity in the procurement, operation, sustainment and defense of information systems. This and other concepts are being explored by a Cyberspace Task Force.

CONCLUSION

Your Air Force of today and of the future will strengthen the entire joint and coalition team. Dominance of air, space, and cyberspace paves the way to overall success. In keeping with the current emphasis on innovation and transformation, the future Air Force will be a more capable yet leaner force. As the keepers of our Nation's readiness, Congress is in a position to help reach these essential goals and for that we thank you for your unwavering support. For America to hold its military advantage, the Air Force must continue to improve its capabilities to keep pace with the realities of the future battlespace. The United States Air Force is proud to support the joint team and we look forward to addressing Air Force Global Strike issues with your committee.

Senator SESSIONS. Well, good. Let me just pursue a little bit with Mr. Flory and General Cartwright the Global Strike concept. I know Senator Nelson is in a rush and now trying to finish up here, but you mentioned Prompt Global Strike, what is the difference from other Global Strike forces and under what circumstances is it that a Prompt Global Strike is better or necessary?

General CARTWRIGHT. The differentiation between Global Strike and Prompt Global Strike, Global Strike today, we have fielded, as the Secretary laid out, a set of new capabilities in the past year that are very significant in Global Strike for the conventional side of the equation. We have fielded a new sea-launched cruise missile, the next generation of the Tomahawk cruise missile that is sea-launched. We have fielded a new air-launched cruise missile that goes on both our tactical aircraft and our bombers, and we have added in additional joint direct-attack munitions that were so effective in the last two conflicts that we have fought. We have increased the inventories there. Those have given us a Global Strike capability that is very significant and very capable. You will see this year two additional, what used to be SSBN-type submarines for ballistic missiles, two of the four that have been converted will field this year to SSGN, which allows Special Operations Forces and these new sea-launched cruise missiles to be used from that platform. So, we've added to the Global Strike capability.

The difficulty here for Prompt Global Strike is, as I said, the adversary may not choose to act near our bases or our patrol areas. If that's the case, and we're dealing with targets that are associated with weapons of mass destruction, command and control, terrorist-type leadership targets, these targets tend to be fleeting. They don't present themselves for long periods of time. They tend to be targets that have great second and third order consequence or regret for the Nation. If it has to do with WMD and the delivery of WMD, say by a missile or by a terrorist group, et cetera, you want to have the opportunity to address these targets.

In many cases, nuclear weapons are not going to be an appropriate choice for those types of targets. You want a conventional alternative. For that small, highly important set of targets, we are basically offering the capability to use a conventional ballistic missile to reach out anyplace on the face of the Earth, and a goal that we have set is to be able to address these targets in 1 hour. We

are working our way towards that. The ability to have a command and control system that can work in those kinds of time lines, the intelligence that it takes to support that, and the planning factors and capabilities that it takes to support it are all things that we are now starting to field.

Senator SESSIONS. The aircraft that launched our sea-based cruise missiles, are they just too slow?

General CARTWRIGHT. Too slow. What we have seen, and there are numerous examples from the recent conflicts, first days of the Iraq War, of dealing in time lines of 4 to 10 hours in order to close on fleeting targets that are significant and important to the Nation. The activities that were associated with Afghanistan in trying to get up into the mountain areas, it took us several weeks to get the overflight clearances and all of the positioning of forces in order to be able to close with what turned out to be some very high-value targets had we been able to prosecute them.

You never know. I mean, I'm not here to tell you that we missed a target, and that would have changed the whole shape of the conflict. But there are targets out there that you'd like to be able to get to very quickly that could potentially change the whole course of the conflict, and those are the types of things that we are looking at with this capability.

Mr. FLORY. Mr. Chairman?

Senator SESSIONS. I can see that would be a benefit. Secretary Flory?

Mr. FLORY. If I could just add a general point, everything that General Cartwright says is, I think, just right. Looking at this from the perspective of the policymaker and looking at this from the perspective of giving the President options, I think it's helpful you focus on the promptness point and appropriately because that's an extremely important point. We have capabilities. We have capabilities that are accurate and that can do a lot of good things, but to date, we don't have anything that can get there quickly except for a nuclear weapon, which is not the appropriate weapon to use in every circumstance.

If we go back, I think it's instructive to look at the 9/11 Report and the discussion there of the difficulty that President Clinton and his people had dealing with the Osama bin Laden threat and dealing with particularly the period after the African Embassy bombings in August 1998, which had demonstrated that we were under attack from a very serious threat. They worked very hard. Very dedicated, diligent, professionals worked very hard to come up with options, to come up with opportunities to do something about that threat. If you read through the report, what you see constantly is concerns about boots on the ground, concerns about basing access, concerns about overflight, concerns about timing. Although less of an issue there, you could also have concerns about air defenses and all kinds of other things that could constrain the options that a President might have.

I think the lesson we learned out of that is the need to try to come up with this full spectrum of options for the President so that in a difficult situation like that, and a challenging situation like that, where the traditional options for one reason or the other do not work or do not give him a risk benefit calculation that is ac-

ceptable, that we can try and fill in that gap, and that's the reason why we believe that this conventional Trident system is something worth pursuing.

Senator SESSIONS. Senator Nelson?

Senator BILL NELSON. Is the kinetic energy on an incoming D-5 warhead—is it such that it can penetrate the earth rather deeply?

General CARTWRIGHT. We're still in the test phase, but as you know from your background, we're dealing in the 1,500 feet per second area. With a reentry vehicle, we're dealing somewhere between 14,000 and 20,000 feet per second. That energy is significant. We call them slumps. It's a shaped mass that we use which we intend to use here as one of the alternatives. With that kind of energy, the round survives, and it just penetrates. Now, you have to look at the geology and the continuity of the geologies to know how deep, but there's not much doubt in our mind that it will have applicability against hard targets, that it will have applicability against buried targets. We need to do further testing to understand how deep. Is that a fair interpretation?

Admiral YOUNG. Yes, sir. There's a lot of variables there, this round is not a penetrating warhead that we have read about, it is a warhead that does penetrate the earth, but not to significant amounts and certainly is dependent upon the type of soil, the type of area that it is.

Senator BILL NELSON. So, this isn't the way you go at the deeply hardened targets?

Admiral YOUNG. No, sir, it is not.

Senator BILL NELSON. This is just a quick reaction?

Admiral YOUNG. Yes, sir.

General CARTWRIGHT. It probably would, though, have both the accuracy and the energy to close entrances and exits very efficiently.

Senator BILL NELSON. Let's assume that this weapon is fired from a submarine in the Atlantic for a target in Afghanistan and you have a flight time of maybe 25 minutes. Now, how in the world are you going to convince Russia that that's not a nuclear weapon being fired at them since it's going to go right over Russia?

General CARTWRIGHT. Two pieces: First, we'd have the option of using a different trajectory. In other words, as we go through the basing construct of where we would position the submarines, we intend to optimize that so that we do not have to do overfly, particularly of Russia. It's one of the things that certainly was a factor in deciding to move to the sea-based and mobile platform, was to have that option. That's the first point. The second point—well, this is probably not the appropriate place to talk about the exact characteristics of what any country has in the way of warning. The Russians will know very quickly, as they have all the way through the Cold War and up to today, what the trajectory is and where the impact points will be. That is well within their technology.

Senator BILL NELSON. So, that's the way then, Mr. Secretary, that you say that you can let other people know that this is not an incoming nuclear warhead?

Mr. FLORY. Sir, I think there are a number of ways. First of all, there are the observable characteristics, which, as General Cart-

wright said, would fairly quickly become clear, say to the Russians, that this was not something that was going to Russia. It would also be one or maybe two systems, two weapons coming at them, and I think that the Russians, first of all, would be able to discriminate that. They'd understand that this was a very small number of weapons, and I think they would understand, particularly in the context of a possible pre-notification from the United States, that not only had we told them that this was not an all-out attack on Russia, but from the fact that there are only a couple of missiles in the air, that it wouldn't look like any kind of all-out attack that they might, it wouldn't look like the way they would imagine us conducting an attack against Russia if we desired to make an attack against Russia.

Senator BILL NELSON. But if your protocol is to give the President the opportunity within 1 hour to hit a high-value target, you're not exactly going to want to have a lot of pre-notification. So, how do you do that?

Mr. FLORY. Senator, I don't think you need a lot of pre-notification. You obviously need to have enough notification so that it has the desired effect so that the message can be passed. On the other hand, I think it's also true that in a given situation, say an attack against a terrorist target in Afghanistan, this is not something just as a matter of Russia's policy. I don't think that Russia's going to have any objection to, and it's not something that I think the Russians would feel any particular inclination to want to warn the target about. I think these are all factors that would clearly have to be part of the decision. You're absolutely right in that the President, in looking at a launch of this type, would have to weight all of these factors, but I think there are things that can be dealt with and could be weighed out in the decisionmaking process at the time.

Senator BILL NELSON. So, if you found Osama bin Laden in Chechnya, that'd be a more difficult decision?

Mr. FLORY. That would be more complex, Senator.

General CARTWRIGHT. That's a fair assessment.

Mr. FLORY. A fair statement. But the Russians might want to handle that themselves.

Senator BILL NELSON. With one of our D-5s?

Mr. FLORY. No, sir. However they chose to do it.

Senator BILL NELSON. Not if you only have an hour's notice. If you have a high-value target that's going to move, you can't pass that off.

Mr. FLORY. I was responding to your second hypothetical.

Senator BILL NELSON. General, what's the rationale for retiring the 37 B-52s since there has been an extensive upgraded program?

General CARTWRIGHT. Twofold here, and then I'm certainly happy to allow the Air Force to speak also. The first is that as we move forward, originally we had thought about looking at replacements out in the 2025 time line, and the reality is the attributes that we are seeking for the next generation of strike capability, whether it's manned or unmanned, in order to continue to be survivable, in order to continue to deliver the sophisticated weapons that we want to deliver in the future, and in order to continue to be relevant with the three bombers that we have today, we have

to start to think about where do we want to move, what kind of survivability characteristics do we want to have in that fleet, how much of it should be manned versus unmanned, how dynamic is the environment that the aircraft or vehicle will have to live in as to whether or not it could actually even be manned or unmanned, is it a family like we have today, with some of them being more survivable than others, some even have the longer range or different persistence characteristics. Clearly, we need to be able to move back and forth between conventional and nuclear if we are to retain both types of capabilities into the future, which right now I don't see any direction to move away from that.

So, in order to start to experiment and to understand what the art of possible is, two things were decided in the QDR—one was 2020—2025 may be too late. Let's accelerate that up and get it closer to 2015 to 2020 timeframe, 2018 being an objective that we're looking at right now; second, start to explore what the attributes ought to be and what is doable in the technical side that could be achieved by that timeframe. As you indicated in the cruise missile activity and the RRW, finding resource to do that, understanding the resource that might be available, looking at the risks associated with what can I slow down or do less of in order to generate that resource. We have the B-1s. We have the B-2s. The B-2s have just finished an upgrade and are working on their next generation. The B-52s that we have are being upgraded, and we have new weapons for all these platforms. Those weapons have raised the efficiency of the platform, just like precision brought to us the ability to get to what we call number of targets per weapon and sortie versus number of sorties per target.

The next generation weapons that we're fielding, these air-launched cruise missiles, the joint direct-attack munitions, et cetera, are much more efficient than they were in the past. So, of the places that we had in order to take resource and to start to move us towards the next generation capabilities, we felt that we could take a reduction and take the risk in this area in order to move forward, given that we have now a year under our belt with these new weapons, and they're demonstrating their worth, that it was the appropriate time to take some risk.

Senator BILL NELSON. Are you assuming that you will have a new bomber by 2018?

General CARTWRIGHT. That is our objective. In order to protect against that assumption, we are only taking this many. We're not taking an entire class of bomber out, and we are continuing in the robust production of the new weapons.

Senator BILL NELSON. Are all your remaining B-52s going to be at Barksdale?

General CARTWRIGHT. No, they'll be split. We'll have two sites. The B-52s? Yes, two sites.

Senator BILL NELSON. Mr. Chairman, I have a bunch of questions. I'm going to submit them for the record. If I may, since General Cartwright can't be here for next week's hearing on missile defense, I need to ask him this question—the Ground-based Mid-course Defense system was deployed starting in the fall of 2004, but it's not yet been put on constant operational alert. There are still a bunch of integration command and control issues being

worked out, and you haven't had a single successful intercept test. You'd want the system to be placed on operational alert when it's ready and when it's operationally effective, but we don't have that demonstrated yet. So, before you put it on alert status 24/7, will you want to have the confidence from a number of successful intercept flight tests?

General CARTWRIGHT. Those questions, Senator, are right on the mark. As we said last year when we went through this discussion, there were many objectives that we wanted to get highlighted and taken care of over the past year. We have had great success in operationally realistic tests. We have had operational tests across the face of the sensors, which was critical. We have tested the command and control. We have not had the successful intercept, but we now have a successful flight of the operational system. That occurred here just recently. We have two more tests that are scheduled this year, the second of which is to be an operational intercept.

Senator BILL NELSON. Let me just cut to the chase.

General CARTWRIGHT. Yes, sir.

Senator BILL NELSON. What criteria are you going to use to judge that it's ready for operational alert?

General CARTWRIGHT. We had what we called last year a shake-down, which I walked through with the committee last year, but it was putting operators on the system, getting the operationally realistic activities. All of the lessons learned that we went through are in the process of being incorporated into the command and control of the system, into the sensors and into the weapons. That upgrade is due to be completed sometime in the summer of this year. Then we need to make sure that it does what we want it to do—in other words, the command and control performance like the war fighter needs it to perform to give them the confidence the sensors do and the weapons. The long pole in the tent, as you indicate, is the intercept tests. But this summer, we should have a clear understanding of the command and control piece and the sensor piece. Then the weapon has to perform. We have to see intercepts.

Senator BILL NELSON. So, it's possible that we won't have this weapon on operational alert for another year?

General CARTWRIGHT. Yes, the Ground-Based Interceptor (GBI), if it doesn't perform.

Senator BILL NELSON. Thank you, Mr. Chairman, I appreciate it.

Senator SESSIONS. Senator Dorgan.

Senator DORGAN. Mr. Chairman, thank you. First of all, thank you for letting me listen in. We had a hearing this morning in the Appropriations Defense Subcommittee, and General Moseley was there as well as Secretary Wynne talking about a number of these issues. I wanted to come because I was specifically interested in the B-52 issue, but I am also intrigued about the cost of using an ICBM with a conventional weapon. I will probably deal with that later at some point in some other venue, but let me ask about B-52s if I might because my understanding is that we used about 140 B-52s in the first Gulf War. We had 82-84 B-52s cycle in and out of the Afghanistan-Iraq theater, and we are proposing to go to 56 B-52s. I was looking and the B-52 obviously is a bomb truck, a platform, and it has great loiter time and has been used very effec-

tively. But I was looking at the cost per aircraft on our bombers, and General Cartwright, you talked about it as did General Moseley and others about the lack of money to do all that we want to do. I mean, we have to economize, no question.

Senator SESSIONS. Senator Dorgan, I'll just tell you they did start a vote a couple of minutes ago. Whatever your time is, I just want to give you that heads up.

Senator DORGAN. I appreciate that. The average cost per year per aircraft on the B-1 is about \$16 million, B-2 about \$22.5 million, and the B-52 about \$8 million. The B-52 has about a 35-year additional life. I think on average our B-52s have about 16, maybe 14,000 to 16,000 hours on them, probably a third or a fourth the hours of the commercial aircraft you board out here at National Airport, in most cases because they are running them up at 50,000, 60,000, 70,000 hours. The fact is it's an old carcass, but it's rejuvenated—new electronics, the whole thing, much less expensive than the rest of the bomber fleet. I wonder about the tension here between wanting to save money and deciding to retire a substantial portion of that part of the bomber fleet that is the least cost to maintain, having low hours and new electronics.

General CARTWRIGHT. Sure.

Senator DORGAN. I just wanted to ask about that. If this is a budget-driven decision, or if you had your druthers, would you think you'd need more than 56 B-52 bombers?

General CARTWRIGHT. I'll give you my opinion.

Senator DORGAN. Sure.

General CARTWRIGHT. When we look at the bombers, cost is certainly one metric. Wearing this uniform, I never thought I would see a B-52 that was relevant in close air support, direct contact with troops in areas. Yet, given the weapons that we have today, the workhorse has, in fact, shown great utility. That's not arguable, that's fact. But in the period of time that you described, as we bring on these new weapons, the things that made the B-52 relevant—the precision, the number of munitions that could address a large number of targets and persist over the target area for many hours, which that airplane can do with tankers, now the weapons are becoming even more efficient so you can hold at risk even more targets, more diversity in the target sets.

In the survivability side of the equation, in persisting in a target area, generally we look at two key attributes, that is, the stealth of the aircraft and the ability to evade radars and other types of sensors. Then generally, in times past, we also use speed. Speed is, as pilots tend to refer to it, speed is life because if you can go fast, you can also defeat a lot of enemy capabilities. So, it appeared to us, in looking at this as a judgment, that retaining the survivability attributes of the B-2, retaining the speed survivability attributes of the B-1, and retaining the equivalent efficiency of the B-52, but reducing the numbers because you had increasing capability across the munitions, gave us the best spread across the three platforms.

Senator DORGAN. If I just observe the air-launched cruise missiles, of course, are standoffs, so there you're just dealing with the truck, and the most efficient truck there is the B-52 by far.

General CARTWRIGHT. Right.

Senator DORGAN. One third the cost, one half the cost comparing the other two bombers. In addition, I have been a big supporter of the F-22. The reason we want to do that is we want to clear the battlefield and clear the air above it and control it at which point you then loiter above it, in most cases, and use the bomb truck again with precision weapons such as Joint Direct Attack Munitions (JDAMs). It seems to me in those cases, it will almost always augur for the most efficient bomber for us, which is the B-52.

I was here, of course. I've been here through the B-1 and the B-2. I understand why we built the B-2—low-level penetration of Soviet airspace, the stealth and so on, but I also think that we, at this point, are about to make a choice that is at odds and is with significant tension of the desire to save money and still accomplish the same mission. General Cartwright, I respect your answer, and I've heard that answer before, but I do think those of us that are pushing for the F-22 are doing so for a reason and that is to control the airspace and control the battlefield above the battlefield at which point you bring in the bomber truck. I'm telling you, it's pretty hard to find a bomber truck that is more efficient than the B-52. If you want to save one third the money, you bring in the bomber truck that can loiter longer and has low hours and new avionics and costs one third the cost of the other bombers. So, I just make the point. I hope, as we think through this as a Congress and as a Pentagon, that we'll try to think through not only the considerations you just described, but the considerations that we're talking about with respect to trying to fund this F-22 in a robust way in order to control the airspace.

General CARTWRIGHT. I think those are valid considerations. I would just lay out for you how, at least from my perspective, we thought through the equation.

General GORENC. Could I just add something also?

Senator DORGAN. Yes.

General GORENC. With regards to this sir, I think you're absolutely right.

Senator SESSIONS. Pull that microphone on up to you there. There you go.

General GORENC. What I was going to say, I think, sir, you're absolutely right in the sense of when you start comparing the different platforms and things of that sort, I mean it really is a combination of platforms that is going to give you the effect that you want on the battlefield. I think, with regards to the B-52, the issue with this one is that you have those weapons that, in fact, allow it to be more survivable, more effective in the battle space. Consequently, you may not necessarily need as many. It is a workhorse. We have always said it has been, and when we were fielding the Joint Air-to-Surface Standoff Missile (JASSM), basically a very precise munition.

Senator SESSIONS. What would it be launched from?

General GORENC. The B-52.

General CARTWRIGHT. And the B-2.

General GORENC. And the B-2.

General GORENC. It's advancing obviously to the others, but there is also a JASSM-extended range, which will give it a 5-engine model capability. In other words, more capability, which will again

make this platform more effective. I guess my point is, to kind of piggyback here, is yes, this platform has been with us for a long time. It's a great platform, but as the capabilities of the weapon systems get enhanced, and as we fight individuals who, in fact, need to be attacked from different perspectives, I think you'll find that a combination of platforms is the way to go.

Senator SESSIONS. Yes. Senator Dorgan, I'm going to go and vote, and you take your time.

Senator DORGAN. Mr. Chairman, just one point.

Senator SESSIONS. Okay.

Senator DORGAN. I think the precision weapons make the B-52 much more useful and interesting to the Pentagon because you do the same thing as you do with other standoff trucks except at less cost. We do need to talk about new bombers and so on. We talked about it this morning. We have to find ways to fund all of this, which means, with respect to what we're doing current, that we need to find ways to save money.

Senator SESSIONS. Thank you. Those are valuable comments because we all know there's that bow wave out there of procurement issues that are coming up, and some tough choices may have to be made. I am sorry, we do have a vote ongoing now, and there's about 5 minutes left. So, I'll need to rush down. We should be back within 10 or 12 minutes, and we'll be recessed until then.

[Recess.]

Senator SESSIONS. We'll call the meeting back to order. Thank you for staying with us, and I'm sorry to be called away. We have to do those things every now and then—vote, that's what they pay us for, I suppose. I'll ask whoever would want to take the lead on this to deal with it first, and if any of you might want to comment on it. The 2006 QDR recommends prompt high-volume Global Strike to deter aggression or coercion and if deterrent fails to provide a broader range of conditional response options to the President. The Trident modification entails the conversion of only 24 ballistic missiles. This is not the high-volume strike capability envisioned by the QDR, I don't think. Would you tell the committee about your respective Service plans to fulfill the high-volume Global Strike requirement of the QDR? Who wants to start?

General CARTWRIGHT. If I could, Mr. Chairman, and then let the Services follow. But in the construct of Global Strike, we talked today about the attribute of prompt, which is a subset of the broader Global Strike capabilities. We also talked about the significant fielding capabilities that have occurred over the past year. In a concept format, the idea here is that there are a set of high-value, time-sensitive targets. It is not a large set, but there is a set of those. The Trident modification is designed to get at that subset.

Following on behind that are these other capabilities that we described that are associated with sea-launched, air-launched capabilities, tactical aircraft. Given their speed and range, they will, assuming you start from the same point, close at varying rates, but what you get is a constant building of pressure as you add the platforms and capabilities as they are able to close the conflict, and the volume comes from that ever-increasing additive value of platforms and capabilities that close the conflict. So, no, Trident is not high volume, but it gets at the key enabling targets that could poten-

tially change the character of the conflict, could easily alter how long the conflict will go on, and it allows the time to hold the enemy at risk as you close the high-volume fires over time.

Senator SESSIONS. The QDR actually called for high-volume prompt.

General CARTWRIGHT. I understand.

Senator SESSIONS. I don't know, maybe they should have written it like you just explained it.

General CARTWRIGHT. I'm not going there, sir.

Senator SESSIONS. Made good sense to me, but do you think maybe they misspoke there?

General CARTWRIGHT. I'll give you my opinion. The question of volume has more to do with what is the capability that we want. The volume could, in fact, be reflective of how much you are able to leverage with just a few choicely-placed rounds, so to speak, versus large numbers of weapons being the volume side of this. In other words, we do what is called nodal analysis. If we hold a key point at risk, it holds the whole network at risk oftentimes.

Senator SESSIONS. All right. Secretary Flory, do you want to follow up on that, please?

Mr. FLORY. I just was going to add the results, though, and this is a somewhat longer-term option, but it helps get to the high volume point. There are other systems that are in the works—the Army hypersonic system, the Navy's short-range ballistic missile system that's being looked at, and various Air Force systems that the Air Force is looking at, but none of them come online. The importance of the conventional Trident is it's something that we think we could field in 2 years, while these other systems I think the earliest one would come online in 2012 or so.

General CARTWRIGHT. 2012 to 2015.

Mr. FLORY. 2012 to 2015.

Senator SESSIONS. Let me just say this, Secretary Flory, we'll have the Army hypersonic, and the Navy is working on a different system? That would be a part of this mix.

The Air Force also. I'll ask you to mention those, but as we do this in terms of cost, we need to ask ourselves do we need three different systems? General, I don't know where you all would do that, but let me ask about the other two Prompt Global Strike capabilities that other Services would be working on.

Admiral YOUNG. The Navy's Prompt Global Strike is the conventional Trident modification. We have no other program that's going after that capability. We do have a large number of other programs that are providing Global Strike capability: our Carrier Strike Groups, our Expeditionary Strike Groups, and our SSGN Strike Groups that are coming online. Their Strike Groups provide a large volume of strike capability around the areas where they are physically located. This goes to the point that General Cartwright made earlier. They cannot be everywhere where the adversary may be carrying out their actions. So today, the Prompt Global Strike program that the Navy has is the Trident conventional modification program.

Senator SESSIONS. General Gorenc, do you want to add to that?

General GORENC. I would like to mention a couple of things actually. When you think about the high volume, you immediately

would go into the constrict of the bomber-type force. We in the Air Force, of course, have that ongoing with the Phase I, which is the modernization of the B-52, the B-1, the B-2, and all the capabilities that have been highlighted that are enhanced and everything else.

Of course, you are also looking at the 2018 timeframe with our Phase II of looking at what are the options that we have out there that explore the current technologies that would potentially give you the manned, unmanned, or maybe a combination of both.

Then, obviously into the future, our Phase III look, which is, what else is out there that we really would like that maybe would enhance some of the capabilities and things we were looking at, which is speed and getting through an area very fast and launching from different locations that will give you that opportunity for the range and everything else. So, that is the normal way you would kind of think about it from the high volume.

Of course, we are also looking at the exact Prompt Global Strike, which is the requirement for the promptness, which our bomber fleet may not provide in this context of Prompt Global Strike. Then you may be looking at some things like hypersonic vehicles and things of that sort that could be launched into a higher altitude and brought back much like an ICBM-type of a capability, but not necessarily. We are looking at that. We are exploring options and just seeing what we can, in fact, as an Air Force provide to the Prompt Global Strike portion, although we know the contribution that we normally have and provide in the Global Strike overall construct.

Senator SESSIONS. I guess my question is, who is coordinating this? Is there someone saying this is too many different projects and we ought to all work together, or we need each one of them, and is there a coordinator?

General CARTWRIGHT. As the advocate for this area, USSTRATCOM looks across the range of capability, looks at the risks attentive to not having a particular capability or the quantity of the capability and how that matches up with the risk and then acts as an advocate. In a business sense, we are a noisy customer, a demanding customer. We are looking to the Services and what they have in capability, what they have on the drawing boards of the future and looking at the feasibility and how well that matches up with what we think is our best assessment of what we will need in the future. We allow and really encourage tension in the system, competition in the system for the concepts—in this case, looking at the Army Advanced Hypersonic Weapon (AAHW) system versus what the Navy might be thinking about versus what the Air Force might look at in the next generation of their Minuteman or other systems. We try to get the knowledge points and not carry these programs any longer than we have to, but gain the knowledge necessary to make the best choices we can, knowing our crystal ball is not perfect. They have to have some flexibility to adapt to the future. From an advocacy standpoint, I see USSTRATCOM in that seat.

Senator SESSIONS. It strikes me a bit like the unmanned aerial vehicles (UAVs). We ended up with all kinds of people doing research, spending lots and lots of money, buying very small numbers

or too small numbers at pretty high rates per copy, when if we could figure out a way to have one or two and buy them at high volume, we would have probably saved a lot of money. Are we confident we won't be into that now, and who would be responsible for pulling the plug on the programs that are not the most competitive?

General CARTWRIGHT. I certainly would be the first to stand up and give you today, as I did with the B-52, our best judgment and recommendation on that.

Senator SESSIONS. Secretary Flory, you think you have sufficient review oversight in DOD to make sure that programs don't go too long and that we identify the most beneficial early?

Mr. FLORY. Senator, I think we do. As General Cartwright says, he is the consumer on this, and he is saying I want this capability and people can compete to deliver the capability in different ways. At some point the issue of duplication you point to is a real one. There would have to be a necking down decision of what, which of these things works best, which of these things meets the warfighters' needs, which of these things provide the most useful options for the President.

Senator SESSIONS. I think there is a tendency for any Service to be working on something they want to be loyal to theirs and believe it's going to be the final solution, and they all may not be. With regard to AAHW, it flies within the upper atmosphere to its target, the Army is developing that. It could deliver lower cost per round of munition, a high-volume strike capability. How do you see that in the mix? What's your evaluation of that, and what are the other programs that are under consideration?

General CARTWRIGHT. I'll take a whack at that. For the high-speed, long-range precise capabilities, we have started with the Trident modification, the D-5. But as we move forward, we want to be able to understand where are the limitations in our ability to carry that kind of strike forward into the future. What are the technical limitations, what are the operational limitations, policy limitations, et cetera? For vehicles that maneuver at hypersonic speeds, we have technical limitations today that need to be overcome. We are trying to encourage that the laboratories and the R&D houses, whether they be commercial or government, investigate from every angle that they can think of how to solve some of these technical challenges associated with these speeds. The Army Research Lab and the AAHW system concept, which is a concept right now, is one venue by which to do this that is offering promise. They have a concept that looks like if they can overcome what are common technical challenges across all of these programs, they may well be in a position to see that concept mature. It could also be that as they were to solve some of these technical challenges, the technology could be migrated to another platform. Then you start to look at cost versus schedule versus performance and the capabilities the country needs, and you try to, I don't want to say down-select, but you try to focus as quickly as possible on what you think will match your need. The Army concept is very attractive, but they must, like everyone else, conquer some of these technical barriers. The sooner that we can conquer them, then the sooner we can make decisions about investment.

Senator SESSIONS. I know we're in a serious effort to modernize our nuclear forces. Admiral Young, what about the Navy force structure plans for sea-based deterrence? What do you see for the future there?

Admiral YOUNG. Sir, our program of record is the Trident D-5 system. Our requirement is for 14 SSBNs that provide us with 12 operational SSBNs. The Navy has a plan that will take these ships through a refueling cycle that will bring them into the shipyard essentially one per year starting in 2007.

Senator SESSIONS. That will leave you how many deployed?

Admiral YOUNG. That leaves us with 12 operational SSBNs. We're taking these ships out to around the 2042 timeframe. My responsibility is to take the weapon system, the strategic weapon system, and have it meet that same operational timeframe.

Senator SESSIONS. You're confident that these submarines will be solid until 2042?

Admiral YOUNG. Yes, sir.

Senator SESSIONS. Isn't that great?

Admiral YOUNG. Yes, sir.

Senator SESSIONS. How long will that be? How long will they have been in service?

Admiral YOUNG. That will be 45 years total. We have obviously done a lot of engineering analysis to support those findings. But my part of that is actually the D-5 system, and we have a D-5 life extension program which is going to take the D-5 missile and take the components on it that will be hit by obsolescence, the electronic components. There are essentially six packages on that system—two in the guidance and four in the missile. We are going through, right now, the design of those components so that in fiscal year 2008, we will start buying our first D-5 life extension missiles. We'll bring those online so they will Initial Operational Capability in 2013. Along with that, we are also through a modernization program continually modernizing the shipboard equipment. The fire control, which also has a great deal of electronics, we are upgrading that to put components on it that are supportable and also give us the capability that the President, through USSTRATCOM, needs to deploy the system through that timeframe.

Senator SESSIONS. General Gorenc, what about you and Air Force plans for upgrading the nuclear land-based deterrent?

General GORENC. Obviously, we're working hard to make sure that we drop the weapons down or not the weapons necessarily, but the ICBMs from 500 to 450. We're going to make sure, as General Cartwright mentioned, that those get put into the proper locations and are held as necessary. We'll continue doing our testing as needed per year to make sure that the weapons in fact are viable, and we're looking forward to just continuing that modernization effort. Now, as we go forward and look at the replacement for the missile, for the Minuteman III, we are looking at all of those alternatives. We are studying those now. There has been money spent on looking at ways to continue making sure that we have a viable force for the future and that we can continue providing the capabilities that the commander needs out in the field, and we'll continue doing that of course.

Senator SESSIONS. Did you express your view on the B-52 reduction, and did you get to complete your thought on that?

General GORENC. I did.

Senator SESSIONS. Your position of the Air Force.

General GORENC. I have to say, General Cartwright really hit the nail on the head with this as far as the B-52 and where we are going. In a sense, really what you are seeing here is actually a demonstration of what this committee and all of us, in fact, have done as we continue trying to enhance the capabilities out there for the warfighter.

Senator SESSIONS. Are you talking about the way he expressed that?

General GORENC. Yes, the way he expressed it.

Senator SESSIONS. The overall concept calls for jointness and analyzing the customer needs?

General GORENC. Yes, I think so. As we look at platform specifics, sometimes it's very easy for us to get so centric on the platform itself that we forget about what it does. I don't necessarily, for example, need 80 or 100 pieces of things to perform a particular function if I know that I can, in fact, perform that function with a little bit less because I have a great capability, and I thought that the B-52 is a classic example of a system that has proven very effective. Now, because of the capabilities that you have put onto that platform, you are able not necessarily to need as many. So, that was a very good explanation, I thought, as far as how we proceed and how we go forward.

I think another thing that I am noticing is and it relates, in a sense, to your question earlier, Mr. Chairman, on how is the Department actually looking and trading capabilities off. I think that we, in fact, have a very good oversight on making sure that we hold each other accountable within the Services to make sure that we are not going and wasting resources in cases where an individual who may look at it from the outside would go jeez, I can't believe you're doing the same thing. There's a reason why that's happening at that stage of the development. In the future, when you actually procure, you'll find that you're going to whittle it down and actually choose the right thing. I think we're going in the right direction overall, sir.

Senator SESSIONS. I just received notice of another vote that's started. We have a number of questions that are important. We may submit those to you in written form. General Cartwright and Secretary Flory, this is your second hearing today? Is that right?

Mr. FLORY. Yes, sir.

Senator SESSIONS. Bless you. We thank you for your good humor, but it is important. Would either of you care to comment on the GBI sites that we may be looking at around the world, Europe or that region, or is that something that you prefer not to talk about at this time? I know that those matters involve sensitivity to nations who may not be ready to talk about it.

Mr. FLORY. Senator, I'll just leave it at this, we are consulting with some countries. We have had consultations in the past on this subject, possible third site deployment, and those consultations are continuing.

Senator SESSIONS. All right. I want to thank you again for what you are doing. We are benefitting this very moment in Iraq in our strategic posture for decisions made 20 years ago. I think we will probably see a decision process and a production process get a little quicker than it has been over the past, but it still takes time to conceive and develop and deploy a complex weapon system. So, I am glad to hear your long-term thoughts, that you are thinking ahead and that you have a plan to get there. Congress may mess it up, but maybe not. We tend to value your advice and pretty regularly follow it. Are there any other comments you'd like to make for the record to clarify anything that's been said earlier in our hearing today?

General CARTWRIGHT. No, sir.

Senator SESSIONS. All right. Thank you very much. This subcommittee takes seriously our immense responsibilities and we rely so much on you and your advice. With no further business, we will be adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

MINUTEMAN III REDUCTIONS

1. Senator SESSIONS. General Cartwright and Secretary Flory, please explain the strategic rationale for reducing the Intercontinental Ballistic Missiles (ICBM) force structure from 500 single-warhead Minuteman III missiles to a force of 450?

General CARTWRIGHT. A reduction from 500 to 450 Minuteman III missiles enables two efforts without affecting the deterrent value of our ICBM force. First, the reduction in operational Minuteman IIIs will provide test assets necessary for ensuring a reliable missile force into the future. Second, this reduction will preserve Multiple Independent Reentry Vehicle (MIRV) capability on the ICBM force in order to retain the capability and experience necessary to upload additional warheads in the event of an unanticipated change in the threat posture.

Mr. FLORY. During the recent Quadrennial Defense Review (QDR) the Department of Defense's (DOD) senior leaders reevaluated our strategic nuclear force posture in light of both our progress in making nuclear force reductions and in fielding New Triad capabilities. As a result, they determined that—with minimal risk—we could make a further, modest reduction in the number of nuclear-armed ICBMs by retiring 50 Minuteman IIIs.

With this reduction in ICBMs, the United States will continue to maintain an effective, balanced nuclear force posture that provides a secure deterrent while we continue to build the non-nuclear elements of the Global Strike force structure. In addition, the modest reduction in ICBMs will free up missiles for the flight test program.

2. Senator SESSIONS. General Cartwright and Secretary Flory, what impact, if any, will this reduction have on the U.S. nuclear deterrent capability?

General CARTWRIGHT. The reduction in the number of missiles will not affect the deterrent or warfighting value of our ICBM force. The number of ICBM warheads remains at 500, while allowing continued testing of missile assets to ensure reliability of the Minuteman III missile system.

Mr. FLORY. The 10 percent reduction in the size of the Minuteman III force will not affect the number of operationally deployed strategic nuclear warheads we are planning to deploy by 2012 (1,700–2,200). The United States will continue to maintain an effective, balanced nuclear force that provides a secure deterrent, and the reduction of 50 Minuteman III ICBMs will not affect either the deterrent or the warfighting value of our ICBM force.

3. Senator SESSIONS. General Cartwright and Secretary Flory, what are the international policy implications of placing multiple warheads on some of the remaining 450 Minuteman ICBMs?

General CARTWRIGHT. There are no international policy implications in retaining a Multiple Independent Reentry Vehicle capability.

Mr. FLORY. The United States maintains a MIRV capability in a portion of the Minuteman III ICBM force as it is currently deployed. The Department foresees no international policy implications in retaining a MIRV capability in a portion of the Minuteman III ICBM force.

4. Senator SESSIONS. General Gorenc, please explain how the reduction of 50 Minuteman missiles will be accomplished?

General GORENC. Air Force Space Command is currently studying the most cost effective, safe, and expeditious way to draw down 50 ICBMs as directed by the QDR.

5. Senator SESSIONS. General Gorenc, from which ICBM sites will they be removed?

General GORENC. Once Air Force Space Command completes their study, they will propose a course of action to draw down the ICBM force in accordance with the QDR.

6. Senator SESSIONS. General Gorenc, what are the costs or savings associated with this plan?

General GORENC. There is a \$10.9 million operation and maintenance (O&M) cost in the fiscal year 2007 budget request to cover environmental cleanup actions, shipping and storage of removed boosters, and placing the launch facilities in minimal caretaker status. There are additional minor O&M costs expected in fiscal year 2008 and fiscal year 2009 to complete the inactivation. Manpower savings of at least 135 spaces will be realized in fiscal year 2007, with additional savings in fiscal year 2008 and beyond. In addition, O&M and procurement savings are expected in future requests.

7. Senator SESSIONS. General Gorenc, does the Air Force plan to place multiple warheads on some of the remaining 450 Minuteman missiles?

General GORENC. Yes, we will as long as U.S. Transportation Command (USTRANSCOM) war plans direct a multiple warhead configuration capability. USTRANSCOM will review targeting requirements and transmit that data to Air Force Space Command. Air Force Space Command will configure missiles with USTRANSCOM's force structure and warhead mix. All remaining missiles will be capable of carrying between one and three warheads.

8. Senator SESSIONS. General Gorenc, is there funding in the budget request for this purpose?

General GORENC. Yes. There is \$10.9 million (O&M) in fiscal year 2007 to cover environmental cleanup actions, shipping and storage of removed boosters, and placing the launch facilities in minimal caretaker status.

ALTERNATIVES TO CONVENTIONAL TRIDENT MODIFICATION

9. Senator SESSIONS. General Cartwright and Secretary Flory, Secretary Flory's prepared statement notes that the DOD is studying other solutions, both sea- and land-based, for Prompt Global Strike. For example, the Air Force is undergoing an analysis of alternatives for the land-based strategic deterrent; the Army is studying a concept for fielding an advanced hypersonic weapon; and the Navy is studying the development of a conventionally-armed submarine launched ballistic missile (SLBM) with a range of about 1,500 miles. How do these options compare to Conventional Trident Modification (CTM)?

General CARTWRIGHT. The CTM is a hedge capability. It will provide military utility across a range of target types and scenarios and is scheduled for initial operational capability in fiscal year 2009. Currently, competing systems will require technical advancements to refine the systems capabilities adding additional time before operational availability. The expected initial operational capability of alternatives is beyond fiscal year 2013.

Mr. FLORY. The Conventional Trident Missile is the only near-term option for addressing the existing capability gap for prompt, conventional Global Strike. The longer-term goal is to develop a range of Prompt Global Strike capabilities that can provide the President with a wider range of options for addressing the dangers of the new security environment. The studies currently underway regarding other options for conventional Global Strike capabilities have not been completed. However, we anticipate that these options would require significantly more time to develop and field than would the CTM.

10. Senator SESSIONS. General Cartwright and Secretary Flory, why do we need CTM today when there are other, potentially less controversial options, just over the horizon?

General CARTWRIGHT. Currently, there are no other available near- or mid-term Prompt Global Strike options that address the capability gap before fiscal year 2013 at the earliest.

Mr. FLORY. At any moment we could find ourselves in a situation for which a near real-time response with a conventional Global Strike capability could provide an important option for the President. Unfortunately, our current capabilities for prompt, conventional, long-range strike are limited. There is no near-term alternative to Conventional Trident that can address the capability gap for prompt, conventional Global Strike.

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

DEFENSE SCIENCE BOARD REPORT

11. Senator BILL NELSON. General Cartwright, the Defense Science Board completed a report in January on the nuclear weapons infrastructure at the DOD and Department of Energy (DOE). The report was classified but most of the recommendations and findings were not. There are two findings and recommendations that I would ask that you comment on. First, the recommendation that a new organizational structure is needed for the National Nuclear Security Administration (NNSA), and second, a need for greater clarity for requirements and the understanding and knowledge that leads to requirements development. I am concerned that at a minimum the recommendations on the organizational structure are unworkable. On the other hand, the second recommendation reflects a complaint that has existed for years and largely reflects a criticism of the effectiveness of the Nuclear Weapons Council. Would you please share your thoughts on this report?

General CARTWRIGHT. The Defense Science Board report was thorough and thoughtful. U.S. Strategic Command (USSTRATCOM) defers to the Secretaries of Defense and Energy with respect to the management and organizational structure of the nuclear weapon enterprise. However, I am concerned about the long-term sustainability of the nuclear weapon enterprise and believe that it must be transformed to one that is more agile and sustainable to support current and future warfighter needs. I also agree that greater clarity is needed in defining requirements placed on the nuclear weapons enterprise.

ROBUST NUCLEAR EARTH PENETRATOR

12. Senator BILL NELSON. General Gorenc, the Fiscal Year 2006 Defense Authorization and Appropriations Acts included \$4 million in the Air Force budget to conduct a sled test to study and understand the physics of penetrating geologic media. This is the sled test designed by the DOE Sandia National Lab as part of the Robust Nuclear Earth Penetrator study. What is the status of the sled test?

General GORENC. The Secretary of Defense has elected to have the Defense Threat Reduction Agency (DTRA) plan and conduct the penetrator sled test. The Air Force is participating in the test planning process at DTRA's request, but has only a limited role. Further, the \$4 million appropriated (less congressionally-mandated rescissions) to the Air Force in fiscal year 2006 has been transferred to DTRA for execution. Questions concerning penetrator sled test specifics should be addressed to DTRA.

13. Senator BILL NELSON. General Gorenc, Secretary of Energy Bodman said that the DOE would not conduct the sled test nor would it be conducted at a DOE facility, including the Sandia National Lab. He also said that if DOD wanted to conduct the sled test that Sandia would provide the equipment and technical expertise. Has the Air Force requested assistance and technical expertise from Sandia? If so, what assistance has been requested?

General GORENC. The Air Force has not requested any assistance or technical expertise from the Sandia National Laboratories. The Secretary of Defense has elected to have the DTRA plan and conduct the penetrator sled test. The Air Force is providing limited assistance to DTRA in the test planning process at their request.

14. Senator BILL NELSON. General Gorenc, is there any money in the fiscal year 2007 Air Force budget request to support the sled test?

General GORENC. In coordination with the Office of the Secretary of Defense (OSD), the Air Force has requested \$3.047 million in the Air Force Operations and Maintenance account for post-test data reduction and analysis of the data obtained from the fiscal year 2006 penetrator sled test. As agreed between OSD, DTRA, and the Air Force, these funds will be transferred to DTRA in fiscal year 2007 for execution.

15. General Gorenc, will the Air Force pay Sandia for the equipment and technical expertise?

General GORENC. No, the Air Force will not spend any additional funds, other than the \$4 million (less congressionally-mandated rescissions) appropriated and already transferred to DTRA, on the penetrator sled test in fiscal year 2006.

CONVENTIONAL TRIDENT D-5 BALLISTIC MISSILE

16. Senator BILL NELSON. General Cartwright and Admiral Young, a QDR decision is to field within 2 years an initial capability to deliver conventional warheads using Trident D-5 missiles on ballistic missile submarines to meet a prompt global strike mission. All the D-5 missiles on Trident ballistic missile submarines today carry nuclear warheads.

The current plan is to buy 533 upgraded D-5 missiles. The flyaway cost of a D-5 is approximately \$32 million, when the research and development costs are added in and distributed among the total number of missiles the program acquisition unit cost is closer to \$60 million a piece. The acquisition unit cost is the full cost of a system. In addition the cost to convert 24 of the missiles to a conventional warhead would be \$500 million. With initial production costs, upgrade costs, and conversion costs, I estimate that per missile cost of the conventional Trident is \$80 million. Do you agree with this rough estimate? If not, what is your estimate of the program acquisition cost for each converted D-5 missile with four warheads?

General CARTWRIGHT. USSTRATCOM defers to the Navy Strategic Systems Programs.

Admiral YOUNG. While the Navy agrees with the \$60 million and \$80 million cost estimates for a Trident missile as discussed in the question, we believe this is not an accurate measure for costing actual flyaway costs. If you consider the research and development costs more as sunk costs, the P-5 WPN budget exhibit includes a more representative number for a single missile called the Missile Flyaway Unit Cost. The fiscal year 2007 President's budget (PB) exhibit for Trident II (WPN Line Item 1150) includes cost for the last original (pre-LE) Trident II missiles procured in fiscal year 2005 reflecting a missile flyaway cost of \$24.5 million. Additive to that is \$8.0 million, the cost of a full-rate production guidance system, for a total flyaway cost of \$32.5 million. None of these unit costs include the warhead, which is funded by DOE.

If you consider the comparable flyaway unit cost of a single flechette reentry body (RB), approximately \$2.5 million, you could conclude a flyaway CTM missile unit cost will be approximately \$42.5 million [i.e., \$32.5 million Missile and Guidance + \$10 million RB (4 RBs x \$2.5 million)].

17. Senator BILL NELSON. General Cartwright and Admiral Young, the current plan is to buy 533 D-5s, just enough D-5 missiles to meet the requirements of the nuclear mission. If 24 D-5 missiles are converted, will the Navy want to buy more D-5s to sustain the nuclear mission?

General CARTWRIGHT. USSTRATCOM defers to the Navy Strategic Systems Programs.

Admiral YOUNG. No, the Navy has not requested an increase in inventory objective in the fiscal year 2007 President's budget. There is no plan to increase the inventory objective at this time.

18. Senator BILL NELSON. General Cartwright and Admiral Young, what are the target scenarios for using a conventional D-5 missile?

General CARTWRIGHT and Admiral YOUNG. The target scenarios are based on mission requirements. Generally, the CTM is planned to be effective against high value, fleeting targets, such as weapons of mass destruction, terrorists, missiles, radars, and integrated air defense components to list a few. Any scenario that requires the need for a prompt (within an hour) response to a threat could require the need for CTM capabilities.

19. Senator BILL NELSON. General Cartwright and Admiral Young, are there other scenarios—other than terrorists or weapons of mass destruction (WMD)—where you think long range ballistic missiles might come into play?

General CARTWRIGHT and Admiral YOUNG. High-value time-sensitive and emerging targets that cannot be held at risk with existing conventional capabilities due to staging, deployment time, range to effect, or the availability of specific weapon systems.

20. Senator BILL NELSON. General Cartwright and Admiral Young, is the primary reason for development of a conventional D-5 a preemptive first strike mission?

General CARTWRIGHT and Admiral YOUNG. No. The primary reason USSTRATCOM requires the development and employment of the conventional D-5 is to provide the President with a broader range of options for a timely response in a crisis. A rapid response capability allows additional time to confirm intelligence sources and/or for consultation, prior to making a strike decision. Adversaries continue to increase their ability to leverage time, distance, and denied areas to limit our ability to respond. Capability to deliver a conventional payload nearly anywhere on the Earth will provide the President a viable option to assure allies, dissuade competition, deter attacks, and defeat threats, while simultaneously reducing our adversary's freedom of action.

21. Senator BILL NELSON. General Cartwright and Admiral Young, doesn't the President already have options today—ones that are improving—to hit these fleeting targets with existing or planned weapons systems, including precision guided bombs and cruise missiles on strategic and tactical aircraft, attack submarines, and unmanned aerial vehicles?

General CARTWRIGHT and Admiral YOUNG. Current capabilities typically take hours to days to prepare and respond, to deliver desired effect(s). Given sufficient time to prepare and stage assets, current capabilities might well be the preferred option. There are circumstances, though, where all other advanced conventional capabilities fall short of prompt and responsive (closing in less than 60 minutes).

22. Senator BILL NELSON. General Cartwright and Admiral Young, in practice, how much "quicker" would it be to use a conventional long-range ballistic missile rather than other conventional assets, given challenges associated with identifying and locating targets, receiving authority to fire, and having submarines in position to shoot?

General CARTWRIGHT and Admiral YOUNG. The challenges associated with identifying and locating targets, receiving authority to fire, and having sufficient capability in place to achieve the objective are all part of any strike decision calculus. The CTM requirement is driven by our inability to access denied areas with existing conventional capabilities and to hold fleeting high value targets at risk in a prompt manner. In a crisis, where we do not have forward forces in place, or are required to deploy forces to within striking distance, CTM would reduce our response time from execution to effects on target actually buys back decision time. Traditional air-breathing platforms fly at about 500 miles per hour and can require hours to days to prepare and deliver a strike. Conventional long-range ballistic missiles can cover over 5,000 miles in under an hour. The flexibility of the SSBN force allows them to operate freely around the world placing any point on the globe within reach within an hour.

23. Senator BILL NELSON. General Cartwright and Admiral Young, can we develop the necessary intelligence support and command and control systems to both locate and effectively hit potential targets?

General CARTWRIGHT and Admiral YOUNG. Yes, but we must continue to transition intelligence, surveillance, and reconnaissance activities from a legacy approach, directed largely at monitoring nation states in two theaters, to a true global enterprise tailored to meet regional needs.

24. Senator BILL NELSON. General Cartwright and Admiral Young, would this be a presidential decision to launch the \$80 million conventional D-5?

General CARTWRIGHT and Admiral YOUNG. Yes, the President will authorize the use of a CTM capability.

25. Senator BILL NELSON. General Cartwright and Admiral Young, the plan, as I understand it, is to have the Trident submarines carry a combination of 22 nuclear D-5 missiles and two conventional D-5 missiles. It would be impossible to tell the difference between a nuclear D-5 and a conventional D-5 for most or all of the

flight path if launched. How would other countries, notably Russia and China, but also including France and England, know the difference between a conventional and nuclear D-5 missile?

General CARTWRIGHT and Admiral YOUNG. Robust notification procedures would mitigate potential misinterpretation of U.S. intentions by those countries that possess the systems required to monitor ballistic missile in flight. Countries capable of monitoring ballistic trajectories would be able to quickly forecast the target area within tens of miles in seconds.

26. Senator BILL NELSON. General Cartwright and Admiral Young, several weeks ago, Secretary Wynne testified that the Strategic Arms Reduction Treaty (START) notifications for test launches and inspections to count warheads would help solve this problem of distinguishing between a nuclear and non-nuclear D-5 missile launch. Please explain how either of these measures would assist Russia in determining that an operational launch from a U.S. SLBM was not a D-5 with a nuclear warhead? Would the START even allow Russia to confirm whether a nuclear or non-nuclear warhead was on a D-5 at the dock?

General CARTWRIGHT and Admiral YOUNG. START notifications for test launches, and inspection to count warheads will not assist Russia in determining that an operational (combat) launch of a SLBM is not a D-5 with a nuclear warhead.

27. Senator BILL NELSON. General Cartwright and Admiral Young, if notification protocols were in place, how long would it take to provide notification and assurance that a launch was conventional?

General CARTWRIGHT and Admiral YOUNG. Notification protocols are in place. The United States has over a dozen existing direct communications links to counterparts in Russia. As an example, the Moscow-Washington Direct Communications Link Hotline has been in place since 1963 to affect 24/7 communications with the Russian Federation in real time to assure strategic stability.

28. Senator BILL NELSON. General Cartwright and Admiral Young, if the whole goal of Prompt Global Strike is to be able to strike anywhere in the world in less than 60 minutes, would a notification protocol defeat the purpose of Prompt Global Strike?

General CARTWRIGHT and Admiral YOUNG. No. The need for a capability to strike within 60 minutes does not imply that only 60 minutes will be available in a crisis. It means that upon making a decision to strike it will take less than 60 minutes to place warheads on a target. Experience has shown that the time from preliminary warning to confirmation of an impending attack might be relatively fleeting, but details of the impending attack will likely emerge over a period of hours. The DOD will always seek to improve the responsiveness of its forces, in order to provide maximum flexibility, while details of the threat emerge. During this fluid period of hours, leading up to a strike decision, the President may choose to notify other world leaders of imminent U.S. defensive actions. Because it is more responsive, CTM buys time for consultation and intelligence confirmation before committing forces in a provocative fashion.

29. Senator BILL NELSON. General Cartwright and Admiral Young, could you please tell me the status of the request to provide all studies and analyses that have been conducted by DOD addressing or discussing the issues associated with this proposal?

General CARTWRIGHT and Admiral YOUNG. USSTRATCOM defers the question to the OSD.

30. Senator BILL NELSON. General Cartwright and Admiral Young, could you also provide a list of ongoing studies and any additional studies that are planned or will have to be completed in the future?

General CARTWRIGHT and Admiral YOUNG. Ongoing and additional studies included the following:

- (1) The Quadrennial Defense Review Report, February 2006
- (2) The Strategic Capabilities Assessment, April 2005
- (3) Defense Policy Board Study on Strategic Command Initiatives, February 2006
- (4) U.S. Strategic Command Strategic Advisory Group (SAG), 74th SAG Plenary Policy Panel Report, December 2005
- (5) U.S. Strategic Command, Conventional Kinetic Options for Global Deterrence, September 2005

- (6) Ballistic Missile "Overflight" An Assessment of the Issues, Prepared for U.S. Space Command, December 2004
- (7) Next Generation Long-Range Strike Analysis of Alternatives
- (8) Prompt Global Strike Analysis of Alternatives
- (9) Land Based Strategic Deterrence Initial Capabilities Document

31. Senator BILL NELSON. General Cartwright and Admiral Young, has anyone in the Department of State been consulted on this proposal and have they expressed any concerns or raised any issues with the proposal?

General CARTWRIGHT and Admiral YOUNG. USSTRATCOM has invited Ambassador Joseph to participate in a table top exercise highlighting the CTM on 20 April 2006.

32. Senator BILL NELSON. General Cartwright and Admiral Young, will Congress be receiving a reprogramming request to begin work on conventionally armed D-5 missiles in fiscal year 2006?

General CARTWRIGHT and Admiral YOUNG. At this time the DOD has not submitted a request for reprogramming.

33. Senator BILL NELSON. General Cartwright and Admiral Young, has any money already been spent in support of conventionally armed D-5 missiles, and if yes, on what specific activities was the money spent and what was the source of the money?

General CARTWRIGHT. USSTRATCOM defers to the Navy Strategic Systems Programs.

Admiral YOUNG. To date, no Navy funds have been allocated or expended in support of conventionally armed D-5 missiles.

34. Senator BILL NELSON. General Cartwright and Admiral Young, would other countries who want to further develop long-range missiles find this proposal an incentive or cover to proceed with their missile programs?

General CARTWRIGHT and Admiral YOUNG. It is impossible to predict what other countries are going to do. There are over 30 countries with ballistic missile programs today. The development of ballistic missile technology will likely continue whether this initiative goes forward or not.

35. Senator BILL NELSON. General Cartwright and Admiral Young, does this plan undercut U.S. efforts to discourage others from developing long-range ballistic missiles or lower the threshold for use of these missiles?

General CARTWRIGHT and Admiral YOUNG. No. This plan is being developed to provide a solution to the gap in prompt long-range conventional kinetic strike capabilities. It does not lower the threshold for use of other missile systems.

36. Senator BILL NELSON. General Cartwright and Admiral Young, would this proposal increase the risk of accidental, mistaken, or unauthorized use of ballistic missiles by other countries if they too were to use the U.S. example and develop conventional long-range ballistic missiles?

General CARTWRIGHT and Admiral YOUNG. No. The United States is the only country out of the more than 30 that have ballistic missiles that does not have a conventional ballistic missile capability. Other countries will continue to develop their own ballistic missile programs independent of any U.S. example.

37. Senator BILL NELSON. General Cartwright and Admiral Young, has any risk assessment been conducted to analyze the probability of a retaliatory nuclear strike being initiated as a result of a conventional D-5 operational launch?

General CARTWRIGHT and Admiral YOUNG. A disciplined risk assessment approach to achieve a robust misinterpretation mitigation plan is underway and will be validated through exercises and wargames.

B-52 RETIREMENTS

38. Senator BILL NELSON. General Cartwright and General Gorenc, the QDR recommended reducing the B-52H fleet to 56 aircraft from 93 aircraft. At a previous hearing, General Moseley and Secretary Wynne, in response to a question from Senator Levin, agreed to provide copies of all analyses and studies that have been conducted to support the decision to retire 37 B-52H aircraft. What is the status of this request?

General CARTWRIGHT. USSTRATCOM is not witting of the request nor status.

General GORENC. The Air Force performed an operational risk assessment of the impact of a reduced B-52 force structure in light of planned/programmed modernizations and improvements across the entire Global Strike portfolio. This assessment concluded the proposed B-52 force structure/Global Strike portfolio met any single Combatant Commander's Operational War Plan or Major Contingency Operation's requirements. The specific conclusions of this assessment are classified. We are prepared to discuss the assessment with the Senate Armed Services Committee professional staff members.

39. Senator BILL NELSON. General Cartwright and General Gorenc, no documents have been produce to date. When can we expect the documents?

General CARTWRIGHT. USSTRATCOM is not witting of the request nor status.

General GORENC. Air Force Space Command is currently studying the most cost effective, safe, and expeditious way to draw down 50 ICBMs as directed by the QDR.

40. Senator BILL NELSON. General Cartwright and General Gorenc, what is the rational for retiring 37 B-52s, particularly as a fairly extensive upgrade program is well underway?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. The imperative for recapitalization to support the Air Force's transformation is at the forefront of our need to draw down the B-52 force structure. Retiring:

- older aircraft enables reinvestment to modernize the capability of the entire fleet. As we continue down the path of transformation we are willing to accept
- some near-term risk to field a more capable future force. The modernized
 - bomber fleet will have greater lethality, be more responsive and more survivable. There will be improved lethality through numerous weapon
 - integration initiatives such as Joint Air-to-Surface Standoff Missile (JASSM), enhanced guided bomb unit, and avionics mid-life improvements; increased responsiveness through programs such as integrated
 - data link, combat network communications and advanced high frequency radios; and ensured survivability through threat awareness systems, low
- observability upgrades and electronic counter-measure improvements.

The Air Force also continues development on a new land-based, penetrating long-range strike capability to be fielded by 2018. The Air Force remains committed to offset the B-52 reduction and mitigate the associated near-term risk by aggressively increasing the remaining bomber fleet's capabilities through modernization.

41. Senator BILL NELSON. General Cartwright and General Gorenc, why was the decision made to terminate immediately the upgrade programs?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. The decision to exercise contract options for the Electronic Countermeasure Improvement (ECMI) program and the Avionics Midlife Improvement (AMI) program were required by the end of March 2006. The Secretary of the Air Force, Michael Wynne, decided not to exercise the ECMI and AMI contract options in support of the President's budget. We have not terminated the program as ongoing kits installations continue. The B-52 program has currently procured 72 ECMI kits and 81 AMI kits. This decision allows the Air Force to avoid purchasing excess kits. Furthermore, it allows the Air Force to save \$19 million between the ECMI and AMI options.

42. Senator BILL NELSON. General Cartwright and General Gorenc, doesn't immediate termination of the upgrade programs presuppose congressional agreement to retire all 37 B-52Hs?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed fund-

ing and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. The fiscal year 2007 President's budget draws down the B-52 fleet, retiring the 17 attrition reserve aircraft in fiscal year 2007, and reducing the total fleet size from 76 aircraft to 56 aircraft in fiscal year 2008. The decision to exercise contract options for the ECMI program and the AMI program were required by the end of March 2006. The Secretary of the Air Force, Michael Wynne, decided not to exercise the ECMI and AMI contract options in support of the President's budget. This decision allows the Air Force to avoid purchasing excess kits, and to save \$19 million between the ECMI and AMI options. We have not terminated the program as ongoing kits installations continue. The B-52 program has currently procured 72 ECMI kits and 81 AMI kits. The Congressional Defense Subcommittees were notified of the Air Force's intentions to not exercise the ECMI and AMI contract options on 14 March 2006. The vendors were formally told that the Air Force would not exercise the options on either contract on 31 March 2006. Both the ECMI and AMI contracts can be renegotiated if additional kits are required.

43. Senator BILL NELSON. General Cartwright and General Gorenc, the B-52 is often referred to as the "workhorse" of the bomber fleet and, according to Air Force analysis, can continue to fly until the late 2030s, or earlier 2040s, largely because the flying hours are spread among a large number of airframes. With the reduction in the B-52 fleet, won't the number of contingency flying hours increase for the remaining air frames thus hastening the time when the B-52 would otherwise have to be retired?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. Despite the reduction in the B-52 fleet, the programmed flying hours per aircraft will remain the same. As a result, the remaining aircraft would continue to fly at the same utilization (UTE) rate with the same expected service life.

An increase in flying hours is not the key driver in decreasing service life. The key driver is how the aircraft is flown (i.e., usage). For example, in the past 5-6 years, Air Combat Command (ACC) has reduced the low-level flight portion of their training syllabus in favor of performing more high-altitude training. This shift in usage significantly reduced stress on the airframe and effectively increased the economic service life of the platform. Airframe health is continuously monitored via the Aircraft Structural Integrity Program (ASIP).

The Air Force will continue to closely manage the B-52 flying hour and service life programs to yield the maximum years of service from this airframe.

44. Senator BILL NELSON. General Cartwright and General Gorenc, with only 56 B-52 bombers, what is the anticipated retirement date?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. Current projections for the retirement of the B-52 are beyond 2035 based on information known to date and coincident with the projected fielding of a transformational long-range strike capability. The reduction of B-52s from 76 total aircraft (not including the 18 excess attrition reserve) to 56 total aircraft will be accompanied by a proportional decrease in the annual flying hour program. As a result, the retirement projection remains unchanged. However, structural service life is only one factor in determining retirement date of a weapon system. Other considerations include future threats, unforeseen sustainment costs, and fielding of a replacement capability.

45. Senator BILL NELSON. General Cartwright and General Gorenc, what studies have been done to examine B-52 economic life?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed fund-

ing and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. For the B-52, the first economic life study was accomplished during the mid to late 1970s. The purpose was to determine if the B-52 platform was a viable ALCM carrier for the out-years. Since that initial study, economic life projections have been incorporated into the B-52 ASIP as a matter of routine. The ASIP Individual Aircraft Tracking Program performs this calculation using, as input, pilot usage forms from each sortie. Based on the most recent calculations, the B-52 fleet has, on average, 18,516 hours of service life remaining for each aircraft.

46. Senator BILL NELSON. General Cartwright and General Gorenc, the QDR also recommended development of a bomber alternative, referred to as a land-based penetrating long-range strike capability, by 2018. What additional capability could be developed and fielded by 2018 that justifies retirement of the B-52s from a cost and performance basis?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. Through its operational requirements process and the Joint Capabilities Integration and Development System process, the Air Force has identified and validated long-range strike capability requirements and shortfalls. These capabilities/effects-based processes help improve the long-range strike force over time to ensure it has the capabilities needed today and tomorrow. The Air Force plans to keep B-52s as long as the capability/cost analysis justifies doing so; they will likely remain in the inventory for several more decades. At the same time, we are identifying and fielding new capabilities, such as the JASSM and a next generation long-range strike system, that will enable us to reduce/eliminate capability shortfalls so that we can operate effectively in future adversary environments. To that end, the Air Force has developed a three-phased long-range strike strategy:

- Phase 1 - Continues the modernization of legacy bomber fleet to upgrade, strengthen, and increase their combat effectiveness
 - \$3.98 billion (fiscal year 2007 President's budget total for 3010/3600) to upgrade B-1, B-2, and B-52
- Phase 2 - Leverages near-term technologies to start development of a long-range strike capability that augments current fleet in 2018
 - 2006 QDR directs Phase 2 effort
 - Considering manned, unmanned, and optionally manned systems
 - ACC led Analysis of Alternatives (AoA) will provide Air Force leadership with decision quality information to support a Milestone A decision in early 2007
- Phase 3 - Goes beyond 2018 with a system of systems technology push for advanced improvements in speed, range, accuracy, connectivity, and survivability in the 2035 timeframe

47. Senator BILL NELSON. General Cartwright and General Gorenc, what are the options being considered for the bomber to be fielded by 2018?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. The options being considered for the bomber to be fielded by 2018 are manned, unmanned, and optionally manned. As a result of a request for information from the Air Force, industry has responded with several propriety options including manned.

48. Senator BILL NELSON. General Cartwright and General Gorenc, what is the anticipated cost of the 2018 bomber alternative per unit and annual operating costs?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions

specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. We do not have enough information to provide a specific answer at this time. The Air Force AoA will determine options to meet an anticipated capability shortfall in the 2015–2020 timeframe. The AoA is looking at a range of options, including modifications to existing systems and potential new platforms. The AoA is limited to technology mature enough to be fielded by 2018. The AoA is expected to provide data to support the fiscal year 2008 President's budget development. Full analysis and reports will be complete in the first half of 2007.

49. Senator BILL NELSON. General Cartwright and General Gorenc, how does this compare to the B–52 flying hour cost of \$11,384 per hour, the least expensive of the bombers?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. We do not have enough information to provide an answer at this time. The Air Force Next Generation Long Range Strike AoA will determine options to meet an anticipated capability shortfall in the 2015–2020 timeframe. The AoA is looking at a range of options, including modifications to existing systems and potential new platforms. The AoA is expected to provide data to support the fiscal year 2008 President's budget development. Full analysis and reports will be complete in the first half of 2007.

50. Senator BILL NELSON. General Cartwright and General Gorenc, in 2003, the Defense Science Board (DSB) recommended reengining the B–52H because the B–52H is “the most versatile and cost effective weapon system in the bomber inventory.” Moreover the DSB agreed with the Next Generation Bomber Study that “aggressive modernization of bomber fleet will provide new bomber equivalent capability at significantly less cost.” What has changed since then?

General CARTWRIGHT. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. The Air Force must recapitalize and transform while modernizing legacy platforms. A reduction in the number of B–52H aircraft is possible given the enhanced conventional capabilities across the Air Force since 2003; for instance, the JASSM fielded on the B–1 and B–52 in the summer of 2005 and the 500# Joint Direct Attack Munition (JDAM) fielded on the B–2 in the winter of 2005. Further, JASSM fields on the B–2 and F–16 in summer 2006. The 2007 President's budget successfully balances the imperatives for recapitalization and transformation against the need for sustaining legacy force structure.

W–80 NUCLEAR WARHEAD

51. Senator BILL NELSON. General Cartwright, Admiral Young, General Gorenc, and Secretary Flory, a study is currently underway to decide if the Navy and Air Force nuclear cruise missiles should be retired. In the meantime, the DOE is spending about \$100 million per year to get ready to begin a life extension for the W–80 nuclear warhead, the warhead on the cruise missiles. Why not postpone the W–80 work until a final decision is made on whether the cruise missiles and W–80 are needed or not?

General CARTWRIGHT and Admiral YOUNG. The DOD, in conjunction with the DOE and the National Nuclear Security Administration, will examine the way forward pending completion of the study in May.

General GORENC. The DOD is in the final phase of a comprehensive study on the post-2007 cruise missile requirements that includes the current program of record for the W–80 nuclear warhead. Study findings may result in changes to both the Air Force and DOE programs. However, until the study is completed and results approved, any change to the program of record is premature.

Mr. FLORY. The W-80 life extension program has been underway since 1998. We are working towards a quick resolution of the force posture issues associated with cruise missiles, which use the W-80 warhead. The issues relate to decisions about the type of cruise missile, their numbers, and length of time that we must retain cruise missiles to support our deterrence strategy. We are making every effort to support the current congressional budget deliberations on this matter.

52. Senator BILL NELSON. General Cartwright, Admiral Young, General Gorenc, and Secretary Flory, would it make sense, if the life extension work on the W-80 is cancelled or postponed, to assign the first Reliable Replacement Warhead (RRW) to Livermore National Laboratory and let Los Alamos work on the very difficult W-76 life extension, the nuclear warhead for the D-5 missile?

General CARTWRIGHT and Admiral YOUNG. USSTRATCOM defers to the National Nuclear Security Administration.

General GORENC. The Nuclear Weapons Council established a joint Air Force-Navy-NNSA RRW Project Officers Group (POG) to examine the feasibility of the RRW concept. As an integral part of the joint effort, the NNSA laboratories are independently developing design concepts potentially applicable to both the SLBM and the ICBM. The POG will assess the feasibility of the respective design options, and present their findings and recommendations to the NWC in November 2006 for a decision as to the next step for RRW.

Mr. FLORY. The primary linkage between the W-80 life extension program and the RRW program is the extent that each program may compete for limited resources in our stockpile transformation plan. The competition between the two national laboratories for the best RRW design should remain unbiased. A final decision is planned for late in 2006.

53. Senator BILL NELSON. General Cartwright, Admiral Young, General Gorenc, and Secretary Flory, wouldn't this be a more realistic option to ensure success for the RRW?

General CARTWRIGHT and Admiral YOUNG. The success of the RRW program is not dependent upon any one agency's efforts but on the development of an integrated DOD, DOE, and NNSA strategy to move from our legacy stockpile to a nuclear stockpile appropriate to the post-Cold War security environment, with a foundation based on a revitalized, appropriately sized NNSA complex.

General GORENC. The joint Air Force-Navy-NNSA RRW POG is currently evaluating potential design options for the RRW. The POG is scheduled to present their findings and recommendations to the Nuclear Weapons Council this November for a decision as to the next step for RRW.

Mr. FLORY. Success of the RRW will depend primarily upon restoring the nuclear weapons infrastructure that furnishes the capacity to produce RRW designs in sufficient quantities to begin transforming the nuclear stockpile in meaningful ways. If additional resources are needed for the RRW, options to provide the required resources will be developed.

54. Senator BILL NELSON. General Cartwright, Admiral Young, General Gorenc, and Secretary Flory, what role does a decision to keep or retire the air launched cruise missiles play in the decision to retire 37 B-52H bomber aircraft?

General CARTWRIGHT and Admiral YOUNG. USSTRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General GORENC. USSTRATCOM operations plan requirements for air launched cruise missiles is a contributing factor in the Air Force's decision to retire 37 B-52H bomber aircraft. The remaining B-52H bomber aircraft provide delivery capacity for USSTRATCOM operations plan air launched cruise missile requirements.

Mr. FLORY. The reduction in the dual-capable B-52 force is not linked to a decision to keep or retire air-launched cruise missiles. The size of the B-52 force is driven primarily by conventional warfighting needs of regional combatant commanders and not by nuclear force requirements.

55. Senator BILL NELSON. General Cartwright, Admiral Young, General Gorenc, and Secretary Flory, was the decision to retire in whole or in part made in anticipation of the nuclear air launched cruise missiles?

General CARTWRIGHT and Admiral YOUNG. The decision is pending, the study is ongoing.

General GORENC. USSTRATCOM operations plan requirements for air launched cruise missiles are a contributing factor in the Air Force's decision to retire 37 B-52H bomber aircraft. The remaining B-52H bomber aircraft provide delivery capacity for USSTRATCOM operations plan air launched cruise missiles requirements.

Mr. FLORY. The size of the B-52 force is driven primarily by conventional warfighting needs of regional combatant commanders and not by nuclear force requirements. Over the last decade, we have made significant advances in conventional weaponry. These advances have made the B-52 highly efficient in terms of the probability of defeating a target with a single advanced conventional weapon as compared to a large number of "dumb" bombs. These improvements have translated into improved efficiency and a reduced need for large numbers of the aircraft by the combatant commanders.

RETIREMENT OF 50 MINUTEMAN III ICBMS

56. Senator BILL NELSON. General Cartwright, General Gorenc, and Secretary Flory, a decision in the QDR is to retire 50 Minuteman III ICBMs. There are currently 500 Minuteman III ICBMs being downloaded to one nuclear warhead per missile from multiple nuclear warheads. When the 50 are retired I understand that some of the remaining 450 Minuteman III ICBMs will be uploaded or maintained with multiple nuclear warheads. Why is it necessary to retain multiple warheads on the Minuteman III ICBMs?

General CARTWRIGHT. It is necessary to maintain the Nuclear Posture Review directed 500 warheads. Doing so allows us to keep 50 missiles in a Multiple Independent Reentry Vehicle configuration while freeing missiles/boosters to become test assets for the future.

General GORENC. USSTRATCOM determines targeting requirements and transmits that data to Air Force Space Command. As the force provider, Air Force Space Command configures the ICBMs in accordance with USSTRATCOM's warhead and force structure requirements.

Mr. FLORY. The DOD is in the process of reconfiguring the Minuteman III ICBM force with a mix of MIRVed and single-warhead systems while reducing our operationally-deployed strategic nuclear warheads to the Moscow Treaty limits (1,700–2,200). DOD has not reached a final decision on the precise number of warheads that will be retained in the Minuteman III force. However, a mix of ICBMs in both MIRVed and single-warhead configurations will provide appropriate operational flexibility as we move toward a more tailorable deterrent posture appropriate for peer and near-peer competitors, regional WMD states, as well as non-state actors.

NUCLEAR WEAPONS DISMANTLEMENT

57. Senator BILL NELSON. General Cartwright and Secretary Flory, on many occasions administration witnesses talk about significant reductions in the nuclear weapons stockpile, and the 2001 Nuclear Posture Review (NPR) decision to "transition from a threat-based nuclear deterrent with large numbers of deployed and reserve weapons to a deterrent based on capabilities, with a smaller nuclear weapons stockpile." What dismantlement decisions have been made and implemented since 2001 to achieve the reductions?

General CARTWRIGHT. USSTRATCOM defers to the NNSA for the dismantlement schedule.

Mr. FLORY. By the end of this fiscal year 2006, we will have reduced the size of total stockpile by 25 percent since the conclusion of the 2001 NPR. Current policy states that weapons no longer required for deployment or for reliability replacements will be retired and dismantled. By 2012, we plan to retire almost 50 percent of the total stockpile that existed at the end of the NPR. Further reductions are possible. But, we can only achieve significant additional reductions through a capability to produce reliable replacement warheads. We need a restored nuclear weapons infrastructure to accomplish this.

58. Senator BILL NELSON. General Cartwright and Secretary Flory, is the total nuclear weapons stockpile, not just the deployed stockpile, substantially smaller today than it was in 2000?

General CARTWRIGHT. Yes. Since 2000, the total nuclear weapons stockpile has been reduced by about 21 percent.

Mr. FLORY. Yes. By the end of fiscal year 2007 we will have reduced the size of the total stockpile by 25 percent. We intend to reduce the total stockpile by almost 50 percent by fiscal year 2012.

59. Senator BILL NELSON. General Cartwright and Secretary Flory, what part of the transition to a “threat-based nuclear deterrent” discussed in the 2001 NPR has occurred and what is planned?

General CARTWRIGHT. The United States has invested heavily in a new generation of advanced conventional systems such as the JASSM and the Tactical Tomahawk and reconfigured four ballistic missile submarines to guided missile submarines, while retiring the Peacekeeper ballistic missile system and reducing the number of deployed ICBM and SLBM warheads. These actions, in combination with initial steps to deploy an integrated missile defense system, have prepared the DOD to respond to a wider range of potential adversaries while reducing reliance upon nuclear weapons.

Mr. FLORY. The NPR called for a transition to a “capabilities based” strategic force posture.

In response to President Bush’s call for a strategy that addressed today’s threats while preparing to meet future challenges, the DOD presented a new defense strategy in its 2001 QDR. The new defense strategy employs a capabilities-based approach to planning. The essence of capabilities-based planning is to identify capabilities that adversaries could employ and capabilities that could be available to the United States, then evaluate their interaction. It replaces the traditional threat-based approach that focused on specific adversaries or regions of the world. Nuclear force planning employs the same capabilities-based approach.

60. Senator BILL NELSON. General Cartwright and Secretary Flory, how many dismantlements are planned for fiscal year 2006 and for fiscal year 2007 and which weapons will be dismantled in each year?

General CARTWRIGHT. The NNSA is responsible for scheduling and executing the dismantlement of weapons that have been approved for retirement.

Mr. FLORY. Projections of future dismantlement activity are classified. However, I can say that we have dismantled over 13,000 warheads since the end of the Cold War. NNSA is responsible for scheduling and executing the dismantlement of weapons that have been approved for retirement and can provide the actual weapon quantities and types planned for dismantlement in fiscal year 2006 and fiscal year 2007.

61. Senator BILL NELSON. General Cartwright and Secretary Flory, currently there are roughly four weapons in reserve or inactive or other status in the stockpile for every weapon deployed. Under the 2001 NPR is there a goal to reduce this ratio?

General CARTWRIGHT. Yes. The overall goal is to reduce the size of the inactive stockpile.

Mr. FLORY. While I cannot address the specific figures used in your question, two factors that dominate the ratio of deployed and non-deployed strategic warheads are worth noting. First, we must retain a responsive capability to deal with unexpected changes in the international environment. Second, we currently must retain—where it is possible—a number of specific types of warheads as a hedge against the failure of another specific type of deployed warheads. We must continue to maintain replacements until DOE has the infrastructure and the certified capability to replace failed legacy warheads. According to DOE plans, we do not anticipate a fully responsive infrastructure to become available until after 2022.

62. Senator BILL NELSON. General Cartwright and Secretary Flory, will the reliable warhead program allow a reduction in this ratio?

General CARTWRIGHT. USSTRATCOM believes the RRW will enable a reduction in the ratio. An objective of the RRW program is to improve the manufacturability of designs and promote a responsive infrastructure. Once this is achieved a reduction in the ratio between deployed warheads and those retained in a reserve or inactive status could be realized.

Mr. FLORY. Yes. Our goal is to eliminate warheads that no longer serve a significant role in U.S. national security strategy. When the nuclear weapons infrastructure is restored, we will also be able to retire warheads that are currently retained as reliability replacements. According to DOE plans, we do not anticipate a fully responsive infrastructure to become available until after 2022.

63. Senator BILL NELSON. General Cartwright and Secretary Flory, what is the goal?

General CARTWRIGHT. The goal is to retain the minimum number of weapons required to meet operational needs and to respond to technological or strategic surprises in a timely manner. This is done through a combination of a responsive infrastructure and retention of reserve/inactive weapons. The exact ratio of deployed to inactive/reserve weapons is dependent upon the capability of the weapons complex to respond to these surprises.

Mr. FLORY. Our goal is to restore the nuclear warhead infrastructure and then make appropriate reductions in the stockpile in a way that manages risk for the Nation.

64. Senator BILL NELSON. General Cartwright and Secretary Flory, what is a reasonable ratio?

General CARTWRIGHT. The ratio is dependent upon the ability of the infrastructure to meet operational needs and to respond to technological or strategic surprises in a timely manner. This is reviewed during the annual nuclear weapons stockpile memorandum process.

Mr. FLORY. With a restored infrastructure and the ability to replace failed warheads or to respond quickly to negative shifts in the international environment, I would expect the ratio of non-deployed warheads to deployed warheads to drop significantly below current levels. In that situation, I expect that we will maintain only those non-deployed warheads in quantities necessary to support a responsive capability and pipeline logistics activities to support maintenance and modification activities.

65. Senator BILL NELSON. General Cartwright and Secretary Flory, a decision to retire the W-62 warhead from the Minuteman III ICBM was made in the 2001 NPR. Has there been a decision made to dismantle the W-62? If so, when is the first dismantled scheduled?

General CARTWRIGHT. Yes. The NNSA is responsible for scheduling and executing the dismantlement of weapons once they are retired therefore, I would defer to the NNSA for dismantlement information.

Mr. FLORY. Yes. We have already dismantled a number of W-62 warheads and are intending to dismantle more.

[Whereupon at 4:22 p.m., the subcommittee adjourned]

**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2007**

TUESDAY, APRIL 4, 2006

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

MISSILE DEFENSE PROGRAMS

The subcommittee met, pursuant to notice, at 10:23 a.m. in room SD-138, Dirksen Senate Office Building. Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions, Roberts, Thune, Levin, Reed, and Bill Nelson.

Committee staff member present: Leah C. Brewer, nominations and hearings clerk.

Majority staff members present: Robert M. Soofer, professional staff member; and Kristine L. Svinicki, professional staff member.

Minority staff member present: Richard W. Fieldhouse, professional staff member.

Staff assistants present: Jessica L. Kingston and Jill L. Simodejka.

Committee members' assistants present: Chris Arnold, assistant to Senator Roberts; Arch Galloway II, assistant to Senator Sessions; and William K. Sutey, assistant to Senator Bill Nelson.

**OPENING STATEMENT OF SENATOR JEFF SESSIONS,
CHAIRMAN**

Senator SESSIONS. The subcommittee will come to order.

Good morning Gentlemen, I'm sorry, we've had a vote this morning that got us off to a little bit of a slow start. I think others will be joining us as the morning goes along.

I'm pleased to welcome our witnesses today, Peter Flory, Assistant Secretary of Defense for International Security Policy; Lieutenant General Henry Obering, Director of the Missile Defense Agency (MDA); Lieutenant General Larry Dodgen, Commander of the U.S. Army Missile Defense Command who also appears before us today as U.S. Strategic Command's (STRATCOM) Joint Functional Component Commander for Integrated Missile Defense—that's a mouthful; and David Duma, Acting Director for Operational Test and Evaluation in the Department of Defense (DOD).

Gentlemen, I thank you for your service to our Nation and for taking time to join us today as this subcommittee meets to receive testimony on the DOD fiscal year 2007 budget requests for the Missile Defense Program. We are primarily interested in the Department's progress toward building those missile defense capabilities directed for deployment by the President in 2002, including ground-based interceptors (GBIs), sea-based interceptors, and associated radar and sensors, all of which are essential components to a functioning system. In this respect, I would commend the DOD for providing, in just 3 short years, a measure of protection for the American people against long-range ballistic missile threats to our homeland. Clearly this initial defensive capability requires continued refinement, which is why Congress continues to place emphasis on an adequate testing program, a subject we hope to learn more about today.

But perhaps, most important of all, I'll be interested to hear from General Dodgen, who speaks on behalf of the warfighters about the operational readiness of those missile defense capabilities currently fielded, and whether the current pace of deployment is adequate to stay ahead of the threat.

I realize that I don't have to remind our witnesses about the ballistic missile threat, but for those less familiar with the compelling rationale for missile defense, allow me to paraphrase from the testimony before this committee of General B.B. Bell, Commander of U.S. Forces, Korea—who is arguably the combatant commander closest to the threat. General Bell notes that the North Korean ballistic missile inventory includes over 600 short-range SCUD missiles, and as many as 200 medium-range No-dong missiles, capable of reaching Japan. North Korea is also preparing to field a new intermediate-range ballistic missile which could reach U.S. facilities in Okinawa, Guam, and possibly Alaska, and North Korea continues to develop a three-stage missile which could reach the continental United States.

This assessment reinforces, in my mind, the need to field a missile defense capability as promptly as possible, even while we continue to improve and test those systems over time. Senator Reed, do you have any opening comments?

Senator REED. No, Mr. Chairman. Senator Nelson will be here and I would just defer to him, to any statement he would make.

Senator SESSIONS. Senator Roberts?

Senator ROBERTS. No statement, thank you.

Senator SESSIONS. Thank you, I'll recognize Senator Nelson, the ranking member of our subcommittee, when he arrives. I would like to ask each of you to give us an opening statement, if you choose, and would ask you to limit those remarks to 5 minutes if you would, please.

[The prepared statement of Senator Sessions follows:]

PREPARED STATEMENT BY SENATOR JEFF SESSIONS

I am pleased to welcome our witnesses today: Peter Flory, Assistant Secretary of Defense for International Security Policy; Lieutenant General Trey Obering, Director of the Missile Defense Agency; Lieutenant General Larry Dodgen, Commander of the U.S. Army Space and Missile Defense Command—who also appears before us today as U.S. Strategic Command's Joint Functional Component Commander for Integrated Missile Defense; and David Duma, Acting Director for Operational Test

and Evaluation in the Department of Defense (DOD). Gentlemen, I thank you for your service to our Nation and for taking the time to join us here today.

The subcommittee meets today to receive testimony on the DOD fiscal year 2007 budget request for the Missile Defense Program. We are particularly interested in the Department's progress toward fielding those missile defense capabilities directed for deployment by the President in 2002, including ground-based interceptors, sea-based interceptors, and associated radars and sensors.

In this respect, I would commend the DOD for providing, in just 3 short years, a measure of protection for the American people against the long-range ballistic missile threat to our homeland. Clearly, this initial defensive capability requires continued refinement, which is why Congress continues to place emphasis on an adequate testing program, a subject we hope to learn more about today.

But perhaps most important of all, I will be interested to hear from General Dodgen, on behalf of the warfighters, about the operational readiness of those missile defense capabilities currently fielded, and whether the current pace of deployment is adequate to stay ahead of the threat.

I realize that I don't have to remind our witnesses about the ballistic missile threat, but for those less familiar with the compelling rationale for missile defense, allow me to paraphrase from the testimony before this committee of General B.B. Bell, Commander of U.S. Forces in Korea, who is, arguably, the combatant commander closest to the threat.

General Bell notes that the North Korean ballistic missile inventory includes over 600 short-range SCUD missiles and as many as 200 medium-range No Dong missiles capable of reaching Japan. North Korea is also preparing to field a new intermediate range ballistic missile which could reach U.S. facilities in Okinawa, Guam, and possibly Alaska; and North Korea continues to develop a three-stage missile which could reach the continental United States. This assessment reinforces in my mind the need to field missile defense capabilities as promptly as possible, even while we continue to test and improve these systems over time.

Having said this, let me now recognize my distinguished ranking member, Senator Nelson of Florida, for any opening remarks he may have.

Senator SESSIONS. I believe we will start with Secretary Flory.

STATEMENT OF HON. PETER C.W. FLORY, ASSISTANT SECRETARY OF DEFENSE FOR INTERNATIONAL SECURITY POLICY

Mr. FLORY. Chairman Sessions, thank you, Senator Reed, Senator Roberts, it's a pleasure to be before the subcommittee today to provide a policy perspective on our Ballistic Missile Defense (BMD) Program.

BMD has been a top priority of the President, of his administration since day one, and it continues to be one today. At the beginning of the President's first term, the United States faced a very different security environment than the one we had faced during the four and a half decades of the Cold War. In the words of the former Director of Central Intelligence Agency (CIA), Jim Woolsey, words which have been cited quite frequently, "With the demise of the Soviet Union, we found that while we had slain a great dragon, the dragon had been replaced by many dangerous snakes." In other words, the end of the Cold War did not mean that there was not a threat anymore, it simply meant that the United States would face different, and different kinds of threats. One particularly menacing such threat was the spread of weapons of mass destruction (WMD) and the means of delivering them, in particular, ballistic missiles.

To deal with this threat, President Bush in 2001 and 2002 took several bold steps. First, he announced that the United States would exercise its right to withdraw from the 1972 Anti-ballistic Missile (ABM) Treaty. Second, he directed the DOD to begin fielding an initial set of missile defense capabilities for the United

States by the end of the year 2004. What this did was to end what had been for decades, in effect, a research and development-only approach to BMD and direct us to proceed with deployment.

I'm pleased to say that today the United States has all of the pieces in place needed to intercept an incoming long-range ballistic missile. GBIs in Alaska and California, and a network of ground, sea, and spaced-based sensors, a command and control network, and particularly important, trained service men and women who are ready to operate the system.

Now, in 2002 we were well aware that what we fielded in 2004 would be our initial capability, and that is why the President directed us to continue improving the capabilities every time through ongoing test and evaluation programs, through research and development of promising new technologies, and by making continuous improvements to the systems that we had already fielded. You will hear more of the technical and programmatic details of how we're going about this from our fellow panel members in a couple of minutes.

First, I would like to take a few minutes to put the program in strategic context in terms of the evolving threat, and in terms of our overall defense strategy. Most important, the threat posed by ballistic missiles as perceived by the Nation in 2002 continues to grow, and the missiles we're talking about are growing in range, complexity, and the threat they pose. In 1990, around the time of the end of the Cold War, 16 countries possessed ballistic missiles of varying ranges. In 2006, 25 countries possessed these weapons, and the number of countries that possess longer range, i.e., medium/intermediate or intercontinental-range ballistic missiles of the kind that can threaten our friends and allies, or that can threaten the United States potentially, has increased from 5 to 9. Not only is the number of nations possessing these weapons increasing, but the group includes some of the world's most threatening and least responsible regimes, in particular, North Korea and Iran.

As Lieutenant General Michael Maples, the Director of the Defense Intelligence Agency (DIA), recently testified in an unclassified session before this committee, North Korea continues to invest in ballistic missiles—this is not only for its own use, but for foreign sales as well. According to General Maples, Pyongyang is likely developing intermediate and intercontinental ballistic missile capabilities.

Director of National Intelligence (DNI) Negroponte also testified before the committee that, "North Korea claims to have nuclear weapons, a claim that we assess as probably true, and has threatened to proliferate these weapons abroad."

Turning to the Middle East, Iran represents a dangerous nexus, combining a vigorous ballistic missile program, a desire to develop nuclear weapons and a program to do so, and a history of support for international terrorism. Terrorism has been part of Iran's arsenal for decades, in fact, before the September 11 attacks, more Americans have been Iranian-backed terrorists like Hezbollah than by any other terrorist group. Iran has now made ballistic missiles an important part of its strategy as well.

As DNI Negroponte testified before the committee, "The danger that Iran will acquire a nuclear weapon and the ability to integrate

it with ballistic missiles Iran already possesses is a reason for immediate concern. Iran already has the largest inventory of ballistic missiles in the Middle East, and Tehran views its ballistic missiles as an integral part of its strategy to deter, and if necessary, retaliate against forces in the region, including U.S. forces." In this environment, recent statements by Iranian President Ahmadinejad threatening the United States and its friends in the region, most notably Israel, are of particular concern. In October 2005 Ahmadinejad declared that, "Israel must be wiped off the map, and God willing, with the force of God behind it, we shall soon experience a world without the United States and Zionism." The Iranian president also said that, "Anyone who recognizes Israel will burn in the fire of the Islamic nations' fury."

As noted, Iran's ballistic missile forces already cast a shadow over U.S. friends and allies, and over our deployed forces in the Middle East. The Intelligence Community (IC) also assesses that Iran could flight test an ICBM by 2015. The addition of nuclear warheads in an ICBM that could reach the United States would further extend Iran's ability to coerce and threaten others, now to include the United States. There's a limit, Mr. Chairman, to the details we can get into on the actual threat here, but I would commend to the subcommittee members a recent National Intelligence Estimate (NIE) that was done on the ballistic missile threat which gets into these in a lot more detail and specificity.

As we face these threats, BMDs remain an important part of our overall defense strategy. The 2001 Quadrennial Defense Review (QDR) outlined four broad defense policy goals—to assure, dissuade, deter, and if necessary, defend and defeat. Missile defenses support each element of this strategy: they can assure allies and friends that ballistic missiles in the hands of adversaries will not be able to deter the United States from fulfilling its security commitments, or coerce our allies, or to undermine the coalition; to dissuade potential adversaries from investing in or developing ballistic missiles by reducing the value of such programs; to deter ballistic missile attacks and threats by reducing an adversary's confidence that an attack would succeed; and lastly, by defeating missile attacks against the United States, its deployed forces, and its friends and allies in the event that deterrence fails.

Last February, the DOD released the 2006 QDR. The 2006 QDR recognizes that since 2001, the United States has found itself engaged in a long war, a global conflict against violent extremists who use terrorism as their weapon of choice and who are actively seeking WMD. The QDR identifies a number of priorities to guide the Department as it makes choices about how best to defend the Nation and how best to help the Nation win the long war. These priorities include defeating terrorist networks, defending the homeland in depth, shaping the choices of countries at strategic crossroads, and preventing hostile states and non-state actors from acquiring or using WMD.

BMD can make important contributions to each of these priorities. In particular, they can be used to defend the homeland, and defeat the actual use of a ballistic missile attack against the population in territory of the United States or its deployed forces or its friends and allies, and by making an adversary uncertain that an

attack would succeed, that may dissuade others from investing in missiles or deter their use by those who have already acquired them—in other words, supporting the four elements of the strategy in the 2001 QDR.

Mr. Chairman, some have questioned the attention and resources we have devoted to BMD in the years following the September 11 attacks. There's a concern that the main threat to the United States today is terrorism and that a ballistic missile attack against the United States is unlikely. The terrorist threat is clearly a very serious threat to the United States, but we believe it's important to develop capabilities to deal with all threats. The U.S. Government was criticized in the wake of the September 11 attacks for not, "connecting the dots on the terrorist threat," and "for failing to prevent the attacks." With respect to the ballistic missile threat, I think the quotes I've given you before make it quite clear that the dots are out there at this point for all to see, and to be connected. I would not care to be before this committee in the wake of a future ballistic missile attack on the territory and people of the United States explaining why—given all that we know today of ballistic missiles in the hands of dangerous regimes—we had not acted and continued to act to defend the American people.

Senator SESSIONS. Mr. Secretary, we have a time limit, if you could wrap up as you choose.

Mr. FLORY. I will wrap up, Mr. Chairman, I'd be happy to answer questions briefly.

In 2002, the President also directed us, in addition to fielding defenses for the United States, to cooperate with friends and allies to extend the benefit of missile defense to them. We are embarked upon a number of initiatives with partners including the United Kingdom (U.K.), Denmark, Israel, Germany, Australia, and Japan, which is our largest partner. We also continue to seek practical areas of cooperation with Russia on a bilateral basis as well as in the NATO-Russia context.

Mr. Chairman, I will conclude on that note, and be happy to answer your questions.

[The prepared statement of Mr. Flory follows:]

PREPARED STATEMENT BY HON. PETER C.W. FLORY

Chairman Sessions, Ranking Member Nelson, members of the subcommittee, it is a pleasure to be with you today to provide the subcommittee with a policy perspective on the progress we've made to date in the area of ballistic missile defense (BMD) and where we are headed. BMD has been a top defense priority of the administration from day one, and it remains a top priority.

I thought it might be useful to begin by reviewing how we got to where we are today.

At the beginning of the administration, the United States faced a very different security environment from the one we faced during the 4½ decades of the Cold War. Former Director of Central Intelligence James Woolsey has pointed out that with the demise of the Soviet Union, we found that while we had slain a great dragon, the dragon had been replaced by many dangerous snakes. In other words, the end of the Cold War did not mean that the United States no longer faced a threat; rather, it meant that the United States would face different kinds of threats.

One such threat was the spread of weapons of mass destruction (WMD) and the means of delivering them, in particular ballistic missiles. Yet, the 1972 Anti-Ballistic Missile Treaty between the U.S. and the Soviet Union prohibited us from fielding an effective defense against this growing threat. Regimes in countries such as North Korea and Iran and, at the time, Iraq understood that while they could not hope to match the United States in conventional forces, they could gain strategic

leverage by investing in ballistic missiles. The strategic wisdom of leaving the American people vulnerable to missile attack as a matter of policy during the Cold War was—at best—debatable. The wisdom of maintaining such a policy in the post-Cold War environment is not. Without a defense against ballistic missiles, the American people are vulnerable to the growing threat of missile attack. Without defenses, a U.S. President faced with a threat to vital U.S. interests from a rogue state armed with long-range missiles would have to take into account the fact that the United States homeland could be at risk.

To deal with this threat, President Bush in 2001 and 2002 took several bold steps. First, he announced that the United States would exercise its right, which was enshrined in the Anti-Ballistic Missile Treaty, to withdraw from the treaty. Second, he directed the Department of Defense (DOD) to end what had been for decades a “research and development only” approach to BMD, and to begin fielding an initial set of missile defense capabilities for the United States by the end of 2004.

I am pleased to say that we have by and large met the goal set by the President. In 2002, Fort Greely, Alaska, was an inactive installation, having been on the 1995 Base Realignment and Closure (BRAC) list. Two years later, it was a missile defense interceptor site. The United States today has all of the pieces in place needed to intercept an incoming long-range ballistic missile: ground-based interceptors in Alaska and California; a network of ground, sea, and space-based sensors; a command and control network; and most importantly, trained servicemen and women ready to operate the system. Our BMD System today is primarily oriented toward continued development and testing. But we believe that, although the system’s capability is limited and in its initial stage, the necessary elements are in place to intercept a long-range ballistic missile.

Because of the importance of this mission, one of the first things I did upon assuming my current position in the DOD was to take a trip to Fort Greely. I want to tell you how impressed I was, not just with the site itself—the buildings, the silos, the command and control systems—but with the dedication, the professionalism, and the sense of mission of the men and women who stand ready to operate the system. I would encourage you all to visit Fort Greely. It is a long way for most of you. I know that the men and women stationed there would appreciate the visit, and that you will be as impressed as I was.

Our BMDs are not as capable today as they will be in the future. The President knew in 2002 that what we fielded in 2004 would be our initial capabilities. This is why he directed us to continue improving these capabilities over time through an ongoing test and evaluation program, through research and development of promising new technologies, and by making continuous improvements to the systems we have already fielded. You will hear more of the programmatic details of how we are going about this from my fellow panel members in a few minutes.

But first I would like to take a few minutes to put this program in its strategic context, in terms of the evolving threat, and in terms of our overall defense strategy.

First and foremost, the threat posed by ballistic missiles is growing. The missiles we are talking about are growing in range, complexity, and the threat they pose. In 1990, around the end of the Cold War, 16 countries possessed ballistic missiles of varying ranges. In 2006, 25 countries have them. The number of countries that possess medium, intermediate, or intercontinental range ballistic missiles—i.e., missiles that may reach our friends and allies, and in some cases the U.S. homeland itself has increased from 5 to 9.

Not only is the number of nations possessing ballistic missiles increasing, but this group includes some of the world’s most threatening and least responsible regimes, such as North Korea and Iran.

As Lieutenant General Michael Maples, the Director of the Defense Intelligence Agency (DIA), recently testified in an unclassified session, North Korea continues to invest in ballistic missiles, not only for its own use but for foreign sales as well. According to Lieutenant General Maples, “Pyongyang is likely developing intermediate and intercontinental ballistic missile capabilities.” For over 50 years, U.S. servicemembers have stood on the border between North and South Korea. We have known that if North Korea decided to attack the South, these men and women would immediately be in harm’s way. The prospect of long-range ballistic missiles in the hands of the North means that, for the first time, the American people too would be in harm’s way.

Iran represents a dangerous nexus, combining a vigorous ballistic missile program, a desire to develop nuclear weapons, and a history of support for international terrorism. The most recent edition of the State Department’s *Patterns of Global Terrorism* (April 29, 2004) describes Iran as the world’s most active state sponsor of terrorism.

Terrorism has been part of Tehran's arsenal for decades. In fact, before the September 11 attacks, more Americans had been killed by Iranian-backed terrorists like Hezbollah than by any other terrorist group. Iran has now made ballistic missiles an important part of its defense strategy—scenes of Iranian missiles on display in military parades are reminiscent of the Soviet Union. Further, as Director of National Intelligence (DNI) John Negroponte recently testified before Congress, Iran has engaged in a clandestine uranium enrichment program for nearly two decades. It is the judgment of the Intelligence Community (IC) that Iran does not yet possess a nuclear weapon or have the necessary fissile material to do so, but the DNI testified that “the danger that it will acquire a nuclear weapon and the ability to integrate it with the ballistic missiles Iran already possesses is a reason for immediate concern.”

In this environment, recent statements by Iranian President Ahmadi-Nejad threatening the United States and its friends in the region, most notably Israel, are of particular concern. In October 2005, Ahmadi-Nejad declared that “Israel must be wiped off the map. God willing, with the force of God behind it, we shall soon experience a world without the United States and Zionism.” He also said that “anybody who recognizes Israel will burn in the fire of the Islamic nation's fury.”

The IC assesses that Iran could flight test an ICBM by 2015. Iran's ballistic missiles already cast a shadow over U.S. friends and allies, and our deployed forces, in the Middle East. The addition of nuclear warheads and an ICBM that could reach the U.S. would further extend Iran's ability to coerce others and threaten the U.S.

The United States continues to support efforts by the United Nations Security Council to reach a diplomatic solution to the issue of Iran's nuclear activities. But, we need to take steps to safeguard our interests and the interests of friends and allies in the event diplomatic efforts do not succeed. The Iranian case is just one example of a WMD proliferation problem that, thanks to ballistic missile technology, could directly threaten the American people. We must be prepared for this possibility, and for others to follow suit. The continued development and fielding of missile defenses is one vital step to defend against such threats, as well as to reduce the attractiveness, to other countries of concern, of such WMD and missile technology.

As we face these threats, BMDs remain an important part of our overall defense strategy. The 2001 Quadrennial Defense Review (QDR) outlined four broad defense policy goals: to assure, dissuade, deter, and if necessary defend and defeat. Missile defenses help to:

- Assure allies and friends that ballistic missiles will not be able to deter the U.S. from fulfilling its security commitments, coerce our allies, or undermine a coalition;
- Dissuade potential adversaries from investing in or developing ballistic missiles by reducing the value of such weapons;
- Deter ballistic missile attacks and threats by reducing an adversary's confidence in the success of an attack; and
- Defeat missile attacks against the United States, its deployed forces, and its friends and allies in the event deterrence fails.

In February, the DOD released the 2006 QDR. The QDR recognizes that since the 2001 QDR, the United States has found itself engaged in a “long war,” a global conflict against violent extremists who use terrorism as their weapon of choice, and who are actively seeking weapons of mass destruction. We believe that ballistic missile defenses play an important part in this long war. The QDR identifies a number of priorities to guide the Department as it makes choices about how best to help the Nation win the long war. These priorities include: defeating terrorist networks; defending the homeland in depth; shaping the choices of countries at strategic crossroads; and preventing hostile states and non-state actors from acquiring or using weapons of mass destruction. Ballistic missile defenses can make a contribution to each of these important priorities. They can be used to defend the homeland and defeat the actual use of a ballistic missile against the population and territory of the U.S., its deployed forces, or its friends and allies. By making an adversary uncertain that a ballistic missile attack will succeed, missile defenses may dissuade others from investing in missiles, or deter their use by those who have already acquired them.

Some have questioned the amount of attention we have paid to ballistic missile defense in the years following the September 11 attacks, on the theory that the main threat to the U.S. is terrorism, and a ballistic missile attack against the United States is unlikely. I would turn that argument around somewhat. One of the lessons of September 11 is that nothing is unthinkable. The United States must and can prepare to defend itself against the widest range of threats possible. Leaving

ourselves vulnerable to a type of attack will only increase the likelihood that an adversary will exploit that vulnerability to threaten or attack us.

Further, the U.S. Government was criticized in the wake of September 11 for not "connecting the dots" on the terrorist threat and failing to act to prevent the attacks. With respect to the ballistic missile threat, the dots are out there for all to see. I would not care to be before this committee in the wake of a ballistic missile attack explaining why, given all we know of ballistic missiles in the hands of dangerous regimes, we had not acted to defend the American people.

I spoke earlier about the ballistic missile defense goals laid out by President Bush in 2002. The President directed us then not only to field defenses for the United States, but also to cooperate with friends and allies to extend the benefits of missile defenses to them as well. Since then, we have embarked upon a number of important missile defense initiatives with international friends and partners. We have worked with the United Kingdom to upgrade the early warning radar at Fylingdales so it can perform a ballistic missile defense mission; we reached agreement with Denmark to allow us to upgrade the early warning radar at Thule, Greenland; we continue to work with Israel on the Arrow Ballistic Missile Defense Program; our own Patriot anti-missile system is widely deployed and is available for export; Germany and Italy are our partners in the Medium Extended Range Air Defense System; after we signed a Framework Memorandum of Understanding on missile defense cooperation in 2004 with Australia, Canberra has expressed interest in cooperating on a number of potential missile defense projects; and we are negotiating a Defense Technical Cooperation Agreement with Russia to facilitate both government-to-government as well as industry-to-industry missile defense cooperation, while we continue to seek practical areas of cooperation with Russia on a bilateral basis as well as in the NATO-Russia context.

One particularly good news story in international BMD is our cooperation with Japan. Japan has committed to spending the equivalent of roughly 1 billion U.S. dollars on BMD, making it our largest international partner in missile defense. The United States and Japan have agreed to work together to develop a more capable sea-based interceptor that will improve the defense of both the U.S. and Japan. I am especially pleased by the recent announcement that Japanese officials have agreed to place of an X-band missile defense radar at the Shariki Air Defense Missile Station. I hope this will lead soon to a final agreement between our two countries to field this radar, which will help defend both the U.S. and Japan from ballistic missile attack. In addition, the U.S. and Japan are taking the steps necessary to share BMD information with one another.

We also are considering fielding long-range missile defense interceptors and radars in Europe. There is roughly \$120 million in the President's fiscal year 2007 budget request to begin work on this project. Such a site would house interceptors very similar to those we have currently fielded at Fort Greely, Alaska; and Vandenberg Air Force Base, California. Fielding such a capability would improve the defense of the United States against long-range missiles, especially those launched from the Middle East. It also would begin to extend missile defense to our European allies, protecting their populations from attack and reducing the risk of coercion or blackmail.

The U.S. Government has held consultations with a number of Allies, beginning in 2002, about their willingness to host missile defense interceptors. We are continuing these consultations with allies who have expressed interest, and we intend to conduct site surveys as appropriate. We hope to be in a position to make an inter-agency recommendation to the President on the issue later this year.

Thank you, Mr. Chairman. I look forward to answering your questions and those of the subcommittee members after my colleagues have presented their testimony.

Senator SESSIONS. Thank you very much.

Lieutenant General Obering, we're delighted to have you with us, Commander of the Army Space and Missile Defense Command.

**STATEMENT OF LT. GEN. HENRY A. OBERING III, USAF,
DIRECTOR, MISSILE DEFENSE AGENCY**

General OBERING. Good morning Mr. Chairman, distinguished members of the subcommittee, it's an honor to appear before you today. I've prepared a written statement that I ask be entered into the record.

Senator SESSIONS. We'll be glad to do that, and Secretary Flory, we'll be glad to have your full remarks in the record also.

Mr. FLORY. Thank you, and I apologize for not asking for that.

General OBERING. Since I last addressed this committee we've made good progress developing and fielding an integrated, layered system to defend the United States, our deployed forces, allies and friends against ballistic missiles of all ranges, in all phases of flight. We have implemented improved mission assurance processes, established an increasingly robust and operationally focused test program, and continued the fielding of the system. With the 2007 budget request, we plan to expand the development, fielding, and verification of this critically needed defense.

Proliferating ballistic missile systems increasingly pose a danger to our national security. Last year there were nearly 80 foreign ballistic missile launches alone. Our program is structured to meet this evolving threat. We balance the early fielding of system elements with steady improvements through a spiral development and test approach. We use knowledge points to measure development progress by focusing on a set of critical activities that define the program's risk. This approach allows us to make informed decisions on whether and how the development activity should advance.

2007 will be a very intense and demanding period for us. As such, we're requesting \$9.3 billion to support our program of work, about \$2.4 billion covers the continued fielding and sustainment of system components, including the long-range, ground-based, mid-course defenses; short- to intermediate-range defenses involving the sea-based interceptors; and all supporting radars, command, control, battle management, and communications capabilities.

Approximately \$6.9 billion will be invested in development for evolution and testing of the system. As I've detailed our request for 2007, though, I think it appropriate to review our work with the budget that you previously approved.

Last year, members of the committee expressed significant interest in a better review of the ground-based midcourse test aborts and the future of our test program. The Independent Review Team concluded we are on the right track, but we needed to make adjustments in several areas including quality control, systems engineering, and test readiness. I established a Mission Readiness Task Force to assure these adjustments were made, and I delayed the interceptor deployment in 2005 accordingly. We are now undertaking the additional qualification tests, and have implemented stronger engineering accountability, configuration management, and mission assurance processes. These comprehensive reviews and our recent test successes indicate that interceptor deployment should continue, but I will pause again, if necessary.

We recently emplaced three more interceptors in Alaska on our way to 16 total, including the California site by December. This progress is critical, since we expect the Ground-based Midcourse Defense (GMD) element to be the backbone of our long-range defense capability for years to come.

Missile defense testing, based on event-driven results, continues to evolve to where "we test as we fight and fight as we test." We cooperate fully with the operational test community and combatant commanders in their efforts to characterize system effectiveness

and readiness. Last year I told you that we planned to conduct two long-range interceptor tests in 2005. That did not happen because we were implementing the recommendations of the Mission Readiness Task Force. With the successful December flight of our operationally configured, long range interceptor, we have resumed an aggressive test program that includes up to three more flight tests planned this year beginning this summer. These will include realistic targets, operational sensors, operational crews, and operational interceptors from operational silos, with two of them planned as intercepts. We will adjust this schedule as needed based on results. Overall, our program includes 38 major system tests in 2006, and 37 in 2007.

Last year, Mr. Chairman, you voiced a concern about the ability of the Cobra Dane radar to support the fire control mission. I am pleased to say that this past September we flew a threat representative, air-launched target across the face of that radar, generating tracks that the operational fire control system then used to produce an intercept solution. We are confident in the capability of this radar. We also reached another major milestone last month when we successfully tested the upgraded Beale radar in California against a realistic ICBM-class target launched from Alaska. Again, the operationally configured fire control system generated an intercept solution from the track data. Later this year, we will deploy the first transportable Forward-Based X-Band Radar to our very important ally, Japan, where it will provide support for both a regional and homeland defense. In the U.K., we expect the upgraded Fylingdales radar to achieve initial capability this year.

In our sea-based sensor program, we added 6 more Aegis Long-Range Surveillance and Track destroyers, for a total of 11. We successfully tested this capability against targets launched from Hawaii and California. In one of our most ambitious efforts, I'm pleased to report that we completed construction of the world's largest Sea-Based X-Band Radar. It has completed extensive sea trials and high-power radiation testing, and is currently in the Hawaii area after its long journey from Texas this winter. Later this year, it will complete its integration and checkout and be stationed in Alaska.

Of our total 2007 budget request, \$2.7 billion would go towards long range midcourse defense. These funds would allow us to continue to improve and build additional interceptors, their silos, support equipment and facilities, as well as order long lead items for the next fielding increment. We plan to field and support up to a total of 22 interceptors and conduct two more flight tests by the end of 2007.

We are also working hard to address the growing threat from Iran. By placing a third long-range interceptor site in Europe along with forward-based sensors in the region, we will meet two major objectives laid out by the President: improved coverage of the United States, and protection for our allies and friends in Europe from ICBM attack. Current plans are to deploy up to 10 interceptors in Europe by 2011, which will expand our total long-range interceptor inventory to 50. The 2007 budget request covers funding for site surveys, planning, facility and support infrastructure design, as well as interceptor long lead items. For sensor coverage,

we will deliver a second Forward-Based X-Band Radar and begin a major upgrade to Thule, Greenland radar.

I would like to turn now to our most important area—command, control, battle management, and communications. This infrastructure is the heart, soul, and brain of our defensive capability and without it, we simply cannot execute the mission. The global foundation we have established for our Nation's leadership and combatant commanders is unmatched in the world, but we have only just begun. We need to expand this to include the integrated fire control that will allow us to mix and match sensors and weapons as a significant force multiplier. We also continue to work closely with the combatant commanders to train and certify missile defense crews by exercising the system with launch-ready demonstrations. The \$264 million we are requesting for these efforts is essential to ensuring an effective missile defense system (MDS).

We are aggressively addressing threats posed by shorter-range ballistic missiles. Nearly \$2 billion in our 2007 budget request is allocated evenly between our Aegis BMD and Terminal High Altitude Area Defense (THAAD) programs to enable us to field capabilities to counter these threats.

In addition to providing long-range surveillance and tracking support, Aegis is providing a flexible, sea-mobile intercept capability against shorter range ballistic missiles (SRBM). This past year we added a second Aegis engagement cruiser to our evolving architecture. In November, we successfully used an Aegis cruiser to engage a separating target carried on a medium-range ballistic missile. We plan to conduct two more intercept tests this year and two more in 2007 using upgraded versions of the interceptor. By the end of 2007 we expect to have three engagement cruisers and seven engagement destroyers available with up to 33 Standard Missile-3 interceptors delivered.

In our THAAD program, we are coming off a very encouraging flight test last November, when we put the redesigned interceptor through its paces. We will continue to characterize its performance and integrate this element into the system. We plan to conduct four more flight tests in 2006, including the first high endo-atmospheric intercept. In 2007 we plan to conduct four intercept tests in both the exo- and endo-atmospheric regions. We will continue our development efforts and plan to field the first unit in Block 2008, with a second unit available in Block 2010.

We have a plan, which we have submitted to the Under Secretary for Acquisition, Technology, and Logistics, that addresses a collaborative effort across the Department to transition BMD elements to the Services. The plan will provide information to the Services to facilitate their 2008 budget submissions.

We have learned that there is no model that will fit all cases. We currently have lead-service agreements to cover Patriot Advanced Capability-3, Aegis BMD, THAAD, and the Upgraded Early Warning Radars. We continue to work with the Department on approval for the remaining elements. It is important to note that this is a continual process and that changes will occur based on capability maturity and fielding schedules.

To keep ahead of future threats, there are several other important development efforts funded in this budget. We continue to fol-

low a strategy of retaining alternative paths until capability is proven. It is a knowledge-based approach.

Being able to address threats worldwide is vital and means moving to space with precision tracking sensors. In 2007, we plan to launch two Space Tracking and Surveillance System (STSS) demonstration satellites to begin critical experimentation. We have budgeted \$380 million for this continuing development effort.

The Airborne Laser (ABL) reached all of its knowledge points for last year when it achieved a full duration lase at operational power and completed initial beam control, fire control flight tests. Currently, we are installing the tracking and atmospheric compensation lasers and preparing the aircraft to accept the high-power laser modules in 2007.

Senator SESSIONS. General Obering, we do have some other presentations, if you can begin to wrap up, but I am pleased.

Senator ROBERTS. Mr. Chairman, would you yield?

Senator SESSIONS. Yes.

Senator ROBERTS. He's discussing the ABL, which is really very special and important to our national defense, I would give them another 30 seconds.

Senator SESSIONS. Absolutely, we'll give them several minutes, but we do have a limit.

Senator ROBERTS. I appreciate that.

Senator SESSIONS. The laser, go on and fully explain that.

General OBERING. Yes, sir. We have planned a campaign of flight tests that will lead to a lethal shoot-down of a ballistic missile in 2008. Nearly \$600 million of our budget request is for this revolutionary work.

In our other boost phase development activity, the Kinetic Energy Interceptor (KEI), we have focused on demonstrating a mobile, land-based very high acceleration booster. This past January we completed the successful static firing of a second stage prototype and will continue static firing tests of the booster's first and second stages in 2007. We have requested almost \$400 million for these efforts.

As threats grow in complexity, we will continue a volume kill capability. The Multiple Kill Vehicle (MKV) program is a generational upgrade to our long range interceptors. In 2005, we made progress in the development of the seeker and made the decision to move to a lower risk propulsion system, which we plan to hover test in 2009.

The committee members expressed interests last year in the international efforts. We have concluded formal agreements with four countries, and several more are pending. Japan continues to make significant investments in multi-layered missile defenses. Working closely with the Japanese since 1999 to develop advanced Standard Missile-3 components, we successfully flight tested a new nosecone just last month. In addition, we've embarked with Japan on the co-development of the 21" Standard Missile-3, which will have greatly expanded performance and defending area capability.

If I turn our attention, finally, to our other allies, Mr. Chairman, we concluded an agreement with Australia to expand cooperative work on sensors. An agreement with Denmark allows us to upgrade the Thule radar and integrate it into the system by 2009,

and we're undertaking a series of technical development efforts with the U.K. in addition to our ongoing work with Israel on the Arrow interceptor and will continue to enhance its missile defenses against emerging threats.

Mr. Chairman, we certainly have our challenges, but for the most part, this program is on track. The successes we've had over the past year bear this out. I greatly appreciate the committee's continued support and patience, but I want to take this opportunity to thank the thousands of Americans and our allies, both in government and industry, that are working hard to make this missile defense a success. Thank you and I look forward to your questions.

[The prepared statement of General Obering follows:]

PREPARED STATEMENT BY LT. GEN. HENRY A. OBERING III, USAF

Good morning, Chairman Sessions, Senator Nelson, members of the subcommittee. It is an honor to be here today to present the Department of Defense's (DOD) fiscal year 2007 Missile Defense program and budget. The Missile Defense Agency (MDA) mission remains one of developing and progressively fielding a joint, integrated, and multilayered Ballistic Missile Defense (BMD) system to defend the United States, our deployed forces, and our allies and friends against ballistic missiles of all ranges by engaging them in all phases of flight. I believe we are on the right track to deliver the multilayered, integrated capabilities that are necessary to counter current and emerging threats.

As was the case last year, our program is structured to balance the initial fielding of system elements with steady improvements using evolutionary development and a test approach that continuously increases our confidence in the effectiveness of the BMD System. This budget balances our capabilities across an evolving threat spectrum that includes rogue nations with increasing ballistic missile expertise.

We are requesting \$9.3 billion to support our program of work in fiscal year 2007. The \$1.6 billion increase from 2006 reflects a return to the annual investment level targeted by the Department for BMD and is indicative of the robust phase we are entering in the development and fielding of the integrated layered capability. Approximately \$1 billion of this increase will be applied to fielding and sustainment, and \$600 million to continued development of the Ballistic Missile Defense System. \$2.4 billion of the fiscal year 2007 request covers the continued incremental fielding and sustainment of long-range ground-based midcourse defense components; our short- to intermediate-range defense involving Aegis ships with their interceptors; and the supporting sensors, command, control, battle management and communication capabilities. This increase in funding for fielding and sustainment of nearly a billion dollars from last year reflects the success we have had across the program. About \$6.9 billion will be invested in continued component improvements, system capability development, and testing.

I would like to review our accomplishments, as well as our shortfalls, over the past year, explain our testing and fielding strategies, and address the next steps in our evolutionary Ballistic Missile Defense Program.

THE EVOLVING SECURITY ENVIRONMENT

Proliferating and evolving ballistic missile systems and associated technologies continue to pose dangers to our national security. In 2005 there were nearly 80 foreign ballistic missile launches around the world. Nearly 60 launches last year involved short-range ballistic missiles, approximately 10 involved medium- and intermediate-range missiles, and about 10 involved long-range ballistic missiles.

North Korea and Iran have not relented in their pursuit of longer-range ballistic missiles. Our current and near-term missile defense fielding activities are a direct response to these dangers. There are also other ballistic missile threats today for which we must be prepared, and there will be others in the mid- to far-term. We must be ready to operate the Ballistic Missile Defense System against new and unexpected threats.

Our potential adversaries continue efforts to acquire ballistic missile systems and technology. Ballistic missiles were used against our forces, our allies and friends during the 1991 and 2003 Gulf Wars. When combined with weapons of mass destruction, they could offer our enemies an attractive counterbalance to the overwhelming conventional superiority exhibited by U.S. and coalition forces during those wars. We can expect that in the future our adversaries could use them to

threaten our foreign policy objectives or pursue a policy of terrorism by holding our cities and other high value assets hostage. After all, those who support global terrorism can hide behind the threats posed by offensive missiles carrying highly destructive or lethal payloads. They will use them to try to deny our forces access to a theater of conflict or to coerce a withdrawal of our forces from that theater. Ballistic missiles provide a way for our adversaries to attempt to achieve some degree of strategic equality with us, especially at a time when ballistic missile defense is still striving to catch up with the progress made by ballistic missile offense over the past four decades.

MISSILE DEFENSE APPROACH—LAYERED DEFENSE

We believe that layered defenses integrated by a robust command and control system, will improve the chances of engaging and destroying a ballistic missile and its payload in-flight. This approach to missile defense also makes the effectiveness of countermeasures much more difficult, since countermeasures designed to work in one phase of flight are not likely to work in another. It is much harder to overcome a complex, multilayered defense. Layered defenses, a time-honored U.S. approach to military operations, provide defense in depth and create synergistic effects designed to frustrate an attack.

With the initial fielding in 2004 of the Ground-based Midcourse Defense (GMD) components, the Aegis long range surveillance and track ships, and the first integrated command, control, battle management and communications (C2BMC) suites, we made history by establishing a limited defensive capability for the United States against a possible long-range ballistic missile attack from North Korea and the Middle East. With the cooperation of our allies and friends, we plan to evolve this defensive capability to make it more effective against all ranges of threats in all phases of flight and expand the system over time with additional interceptors, sensors, and layers.

Since we cannot be certain which specific ballistic missile threats we will face in the future, or from where those threats will originate, our long-term strategy is to strengthen and maximize the flexibility of our missile defense capabilities. As we proceed with this program into the next decade, we will move towards a missile defense force structure that features greater sensor redundancy and sensitivity, interceptor capability and mobility, and increasingly robust C2BMC capabilities. In line with our multilayer approach, we will expand terminal defense protection and place increasing emphasis on boost phase defenses.

We are effectively employing an evolutionary acquisition strategy to field multiple system capabilities while maintaining an aggressive test and development program. The Missile Defense Agency (MDA) continues to evolve and refine desired capabilities, based on warfighter need and technology maturity, through sound risk management. Our goal continues to be one of fielding the best capabilities possible, on schedule, on time, and within cost, in order to address current and emerging threats.

COMPLETING THE FIELDING OF BLOCK 2004

Since I last appeared before this committee, we have made a number of significant accomplishments to complete initial fielding of the Block 2004 capability. We have also fallen short in some areas. When we rolled this program out in 2002, we set out to deploy 10 Ground-Based Interceptors (GBI) in 2004 and another 10 in 2005. A booster motor plant explosion in 2003, which had a major impact across the missile defense program, and the need to step back and undertake a mission readiness review of the GMD program following two test failures caused us to miss our fielding mark. I delayed the GBI deployment in 2005 and made changes based on the recommendations of the mission readiness review. I believe we are now back on track, but I will pause again if necessary. We recently emplaced three more GBIs in silos at Fort Greely, Alaska, for a total of nine, and two at Vandenberg Air Force Base in California. This progress is critical because we expect the GMD element to be the backbone of our national missile defense capability for years to come. Today we continue with interceptor fielding and plan to emplace additional GBIs, for a total of 16 by December of this year.

This past year we also added a second Aegis engagement cruiser and delivered additional Standard Missile-3 interceptors to our evolving sea-based architecture to address short- and medium-range threats in the midcourse phase of flight. We did not advance as rapidly as we hoped. We needed to resolve technical issues associated with the third stage rocket motor and the solid divert and attitude control system to take full advantage of interceptor performance designed to pace the threat. However, we are close to the 10 to 20 sea-based interceptors we projected for deliv-

ery in our initial program. Right now, I am comfortable with where we stand in our sea-based interceptor deployment plans. We will continue to grow our inventory of Standard Missile-3 interceptors for deployment aboard Aegis ships and, by the end of 2006, outfit three Aegis destroyers and one additional cruiser with this engagement capability. In addition to providing surveillance and tracking support to the integrated Ballistic Missile Defense System, Aegis provides a flexible sea-mobile capability to defeat short- to intermediate-range ballistic missiles in the midcourse phase.

In our sensors program, we upgraded the Beale Early Warning Radar in California. The Beale radar complements and works synergistically with the surveillance and tracking capabilities of the fully operational Cobra Dane radar in Alaska, and together they will help us defend against the longer-range threats coming out of East Asia. The Beale radar will play an instrumental role in tests this year to demonstrate the system's ability to intercept intercontinental-range missiles using operationally configured assets.

This past year we added 6 more Aegis Long-Range Surveillance and Track destroyers to our force, for a total of 11. These ships provide much sought-after flexibility in our architecture, giving us more time to engage enemy missiles and improving the performance of the entire system.

We are making good progress in integrating the Sea-Based X-band radar into the system. It is the most powerful radar of its kind in the world and will provide the system a highly advanced detection and discrimination capability. This past January the radar completed its long journey from Texas, where it underwent extensive sea trials and high-power radiation testing in the Gulf of Mexico, to Hawaii. This spring its voyage continues to Adak, Alaska, where it will be home-ported and put on station.

This past year the Forward-Based Radar, our transportable X-band radar, successfully acquired and tracked intercontinental ballistic missiles in tests conducted at Vandenberg Air Force Base. We are now preparing to deploy the radar to provide precision track and discrimination capabilities, which will improve regional and homeland missile defense capabilities.

We also completed subsystem checkout of the Fylingdales radar in the United Kingdom and achieved high-power radiation. We conducted the necessary operator training at that site and are now in the middle of completing an important series of ground tests that are necessary to verify this system's capability, tests that had been deferred on the recommendations of the Mission Readiness Task Force. We expect to complete testing at Fylingdales later this year.

We have an extensive command, control, battle management, and communications infrastructure to support all these elements, and we are ready to provide complete operations and maintenance support to the warfighter. We have taken the first step in integrating the BMD System, which is necessary to establish an affordable and effective global, layered defense. We have installed hardware and software at the United States Northern Command (NORTHCOM), United States Strategic Command (STRATCOM), and United States Pacific Command (PACOM). C2BMC capabilities include basic deliberative crisis planning and common situational awareness at these combatant commands. In addition, we now provide common situational awareness directly to the President of the United States and the Secretary of Defense to aid in decisionmaking. In addition to fielding these suites, we also completed five major software release upgrades this past year, each improving the capability of the command, control, battle management and communications system.

It is this global connective capability that allows us to combine different sensors with different weapons. For example, we are developing the Aegis BMD System so that it can support a ground-based interceptor launch by sending tracking information to the fire control system. A forward-deployed radar can cue and pass tracking information on to, for example, a Patriot Advanced Capability-3 unit, or a regionally deployed Terminal High Altitude Area Defense (THAAD) battery, or a GMD or Aegis BMD engagement ships. In other words, we want to be able to mix and match sensor and interceptor resources to give the system more capability by expanding the detection and engagement zones. Our ability to integrate all of the weapons and sensors into a single package that will use interceptors in the best location to make the kill gives us a critical multiplier effect.

We work closely with STRATCOM and the combatant commanders to certify missile defense crews at all echelons to ensure that they can operate the Ballistic Missile Defense System. We have exercised the command, fire control, battle management and communication capabilities critical to the operation of the system.

We also are continuing to exercise the system to learn how best to operate it, and we have demonstrated our ability to transition smoothly from test to operations and back. In our exercises and tests, we have worked through a number of operational

capability demonstrations in order to increase operational realism and complexity, certify crews and safety procedures, and demonstrate the operational viability of the system. The MDA will continue to coordinate with the warfighter to implement developmental upgrades and improvements in the system to maximize system capability. This is very important since we will continue to improve the capabilities of the system over time, even as we remain ready in the near-term to take advantage of its inherent defensive capability should the need arise.

BUILDING CONFIDENCE THROUGH SPIRAL TESTING

We have consistently pursued a comprehensive and integrated approach to missile defense testing and are gradually making our tests more complex. Missile defense testing has evolved, and will continue to evolve, based on results. We are not in a traditional development, test, and production mode where we test a system, then produce hundreds of units without further testing. We will always be testing and improving this system, using a testing approach that cycles results into our spiral development activities. This approach also means fielding test assets in operational configurations. This dramatically reduces time from development to operations in a mission area where, until now, this nation has been defenseless.

Last year, following the two launch aborts of the interceptor for the Ground-based Midcourse Defense element, I explained that we had several concerns with quality control and reliability; but we did not view the failures as major technical setbacks. In response to those failures, I chartered an independent team to review our test processes, procedures and management. The team concluded that the Ground-based Midcourse Defense program met the challenge of providing an initial defensive capability but found deficiencies in systems engineering, ground qualification testing, flight test readiness certification, contractor process control and program scheduling. The independent review team recommended that the MDA reorient the missile defense program to strengthen its emphasis on mission assurance.

I established a Mission Readiness Task Force under Admiral Kate Paige to implement the corrective actions needed to ensure a return to a successful flight test program. The task force identified steps to strengthen our systems engineering and quality assurance processes and provide the reliability and repeatability necessary for operational success. As a result, we undertook a comprehensive review of these system processes at each step along the way. We are also undertaking the necessary ground and flight qualification tests to retire the risks uncovered by the independent review team and the Mission Readiness Task Force. To strengthen our test program, I diverted four long-range interceptors slated for operational use into testing, with the intent to replace them in 2007 if our test program was successful. Last year, I asked the committee to have patience, knowing that the system's basic functionality was not at risk. As a result of our aggressive actions, I believe that mission assurance and system reliability are now on track.

We finished the year strongly with a string of test successes across the board. These successes continue to build confidence in our spiral development approach. In a major step forward, in September 2005, we flew a threat representative target across the operational Cobra Dane radar and generated an intercept solution using the long-range fire control system. We then flew the operational configuration of the long-range interceptor in December 2005 and put the kill vehicle through its paces. We not only achieved all of the test objectives for that flight, but we also accomplished many of those objectives we identified for the next flight test scheduled for this spring. Just last month, we exercised an engagement sequence that used the Upgraded Early Warning Radar at Beale Air Force Base in California to provide tracking information to a simulated long-range interceptor from an operational site at Vandenberg. Based on the many tests we have conducted to date, including three successful flight tests of the operational long-range booster now emplaced in Alaska and California, we maintain our confidence in the system's basic design, its hit-to-kill effectiveness, and its inherent operational capability. We will continue to test this system to ensure it will remain mission ready.

We continue to work closely with the Director, Operational Test and Evaluation, Operational Test Agencies, and combatant commanders to characterize the effectiveness and readiness of the system at every stage in its development and fielding. This year the fielded BMD System will undergo ever more challenging and operationally realistic testing.

We will begin the important next step of testing our long-range ground-based defense with more operationally robust flight tests as a part of the integrated Ballistic Missile Defense System. With the next tests involving the GBI, we will step up testing complexity and involve operational crews, operational interceptor launch sites, and operational sensors. These tests will involve an operationally configured inter-

ceptor launched from Vandenberg that will attempt to acquire and intercept a target missile launched out of the Kodiak Launch Complex in Alaska. With the last two tests in this series, we will demonstrate the ability of the system to perform more refined acquisition and discrimination functions and the ability of the exo-atmospheric kill vehicle to divert toward the target and intercept it. We also plan to use tracking data from the Sea-Based X-band radar when it is available to feed its data into system tests and operations. In 2007, as we return our focus to fielding long-range interceptors, we plan one system intercept test and two flight tests, all three of which will further demonstrate the operationally configured interceptor.

In our sea-based midcourse defense element, we have continued to ratchet up the degree of realism and reduce testing limitations. This past November, for the first time, we successfully used a U.S. Navy Aegis cruiser to engage a separating target carried on a threat-representative medium-range ballistic missile. A separating target is more challenging to engage because it can fly faster and farther than the boosting missile. In order to increase operational realism, we did not notify the operational ship's crew of the target launch time, and they were forced to react to a dynamic situation. We are planning three more Aegis interceptor flight tests in 2006. Last month, we conducted a very successful cooperative test with Japan involving a simulated target to demonstrate the engagement performance of a modified SM-3 nosecone developed by the Japanese in the U.S./Japan Joint Cooperative Research project. One of the upcoming U.S. Aegis intercept tests will again involve a separating warhead. In 2007 we plan to conduct two tests of the sea-based interceptor against short- and medium-range targets.

Flight-testing involving the redesigned interceptor for the THAAD began last November when we successfully demonstrated the separation and operation of the production booster and kill vehicle. This year we will conduct four more tests to characterize performance of the new missile and the ability to integrate it into the BMD System. Later this year we will also conduct the first intercept test high in the atmosphere. In 2007 we plan to conduct four intercept tests as part of our THAAD flight test program.

Also planned in 2007 are two Arrow system flight tests and one Patriot combined developmental and operational test. The command, control, battle management, and communications infrastructure will be exercised in all of our system level tests.

Ground tests, wargames and modeling and simulation help demonstrate interoperability, assess performance and specification compliance, and develop doctrine, tactics, techniques and procedures. In 2007 we will continue with our successful ground-testing, which involves warfighter personnel and test hardware and software in the integrated system configuration to demonstrate system connectivity and interoperability. Upcoming tests will verify integration of the sea-based, forward-based, and Fylingdales radars. The funds we are requesting also will support additional capability demonstrations and readiness demonstrations led by the warfighting community.

COMPLETING THE NEXT INCREMENT—BLOCK 2006

To keep ahead of rogue nation threats, we continue to hold to the fielding commitments we made to the President for Block 2006, which include investment in the necessary logistics support and command, control, battle management and communications infrastructure. In 2006 and 2007, we will build on the successes we had in 2005 to improve protection against a North Korean threat, provide protection against a threat from the Middle East, expand coverage to allies and friends, increase countermeasure resistance, and improve protection against short-range ballistic missiles. We are also planning to field more mobile, flexible interceptors and associated sensors to meet threats from unanticipated launch locations.

For midcourse capability against the long-range threat, the GMD element budget request for fiscal year 2007 of \$2.7 billion will cover continued development, ground and flight testing, fielding and support. This is about \$125 million more than we budgeted for fiscal year 2007 in last year's submission. The risk-reduction work prescribed by the Mission Readiness Task Force has caused us to reduce the number of interceptors fielded in 2007. This request includes up to 4 additional ground-based interceptors, for a total of 20 interceptors in Alaska by the end of 2007, their silos and associated support equipment and facilities as well as the long-lead items for the next increment. The increase in fiscal year 2007 funding from last year to this year is attributed, in part, to increased sustainment, logistics and force protection requirements, as well as to other needs associated with preparing the system for operations. This budget submission also continues the upgrade of the Thule early warning radar in Greenland and its integration into the system.

The Royal Air Force Fylingdales early warning radar in the United Kingdom will be fully integrated for missile defense purposes by fall 2006. It will provide sensor coverage against Middle East threats.

As part of our effort to make the system more robust, improve defense of our allies, and address threat uncertainties, we are continuing discussions with our allies in Europe regarding the deployment of radars and a third site for ground-based interceptors. Later this year we will be able to give greater definition to this important evolutionary effort.

To address the short- to intermediate-range threat, we are requesting approximately \$1.9 billion to continue development and testing of our sea-based midcourse capability, or Aegis BMD, and our land-based THAAD terminal defense capability. System tests will involve further demonstrations of the sea-based interceptor, and we will continue enhancing the system's discrimination capability. We will continue Standard Missile-3 improvements. We added approximately \$49 million to the fiscal year 2007 request for Aegis BMD from last year to this year to address the Divert and Attitude Control System and other aspects of the system, including the development of a more capable 2-color seeker for the SM-3 kill vehicle. We will continue purchases of the SM-3 interceptor and the upgrading of Aegis ships to perform the BMD mission. By the end of 2007 we will have three Aegis engagement cruisers, seven engagement destroyers, and seven Long Range Surveillance and Track destroyers. These sea-based sensors and weapons will improve our ability to defend the homeland and our deployed troops and our friends and allies. In fiscal year 2007 we will initiate work with Japan for follow-on SM-3 development in order to increase its range and lethality. We also will continue the THAAD development effort that will lead to fielding the first unit in the 2008–2009 timeframe with a second unit available in 2011.

We will continue to roll out sensors that we will net together to detect and track threat targets and improve discrimination of the target set in different phases of flight. In 2007, we will prepare a second forward-based X-band radar for operations. We also are working towards a 2007 launch of two Space Tracking and Surveillance System (STSS) test bed satellites. These demonstration satellites will perform target acquisition and handover and explore approaches for closing the fire control loop globally for the entire BMD System. In fiscal year 2007 we will undertake initial satellite check-out and prepare for tests involving live targets. We are requesting approximately \$380 million in fiscal year 2007 to execute this STSS activity, and \$402 million for the Forward-Based Radar work.

For the Ballistic Missile Defense System to work effectively, all of its separate elements must be integrated by a solid command, control, battle management and communications foundation that spans thousands of miles, multiple time zones, hundreds of kilometers in space and several combatant command areas of responsibility. C2BMC allows us to pass critical information from sensors to provide input for critical engagement decisions. Combatant commanders can use the C2BMC infrastructure to enhance planning and help synchronize globally dispersed missile defense assets. These capabilities also can provide our senior government leadership situational awareness of ballistic missile launches and defense activities.

This C2BMC capability allows us to mix and match sensors, weapons and command centers to dramatically expand our detection and engagement capabilities over what can be achieved by the system's elements operating individually. We cannot execute our basic mission without this foundation.

With this year's budget request for \$264 million for the C2BMC activity, we will continue to use spiral development to incrementally develop, test, and field hardware and software improvements. We will press on with the development of the initial global integrated fire control to integrate Aegis BMD, the forward-based radar, and Ground-based Midcourse Defense assets. We plan to install additional planning and situational awareness capabilities to facilitate executive decisionmaking among the combatant commanders.

The MDA is committed to delivering the best capabilities to the warfighter in a timely manner, and warfighter participation and input is a critical part in the engineering process. Today, the Army National Guard's 100th Missile Defense Brigade, Air Force's Space Warfare Center, and Navy ships in the Pacific Fleet are on station and operating the system. Our fiscal year 2007 request continues to fund critical sustainment and fielding activities and ensure that system developers have financial resources to support fielded components. We will continue to work collaboratively with the combatant commanders and the military Services as the system evolves to define and prioritize requirements. Exercises, wargames, and seminars continue to be important collaboration venues. We will also continue to support training activities to ensure operational readiness, combat effectiveness, and high-level system performance.

There is no silver bullet in missile defense, and strategic uncertainty could surprise us tomorrow. So it is important that we continue our aggressive parallel paths approach to building this integrated, multilayered defensive system. There are several important development efforts funded in this budget.

In executing our program we continue to follow a strategy of retaining alternative development paths until capability is proven—a knowledge-based funding approach. That means we are setting specific targets, or knowledge points, that the development efforts have to reach within certain periods of time. Knowledge points are not reviews, but discrete activities in a development activity that produce data on the most salient risks. The approach involves tradeoffs to address sufficiency of defensive layers—boost, midcourse, terminal; diversity of basing modes—land, sea, air, and space; and considerations of technical, schedule, and cost performance. This is fundamental to how we execute the development program, because it enables us to make decisions as to what we will and will not fund based upon the proven success of each program element.

For example, we are preserving decision flexibility with respect to our boost phase programs until we understand what engagement capabilities they can offer. We have requested approximately \$984 million for these activities in fiscal year 2007. This past year the revolutionary Airborne Laser (ABL) reached its knowledge points when it achieved a full duration lase at operational power and completed initial flight tests involving its beam control/fire control system. The program's knowledge points for 2006 include flight testing of the lasers used for target tracking and atmospheric compensation. This testing, which will test the entire engagement sequence up through the point where we fire the laser, will require use of a low-power laser surrogate for the high-power laser. Once we have completed modification of the aircraft which has begun in Wichita, Kansas, we will start installation of the high-power laser modules in 2007. This will provide us with the first ABL weapon system test bed and allow us to conduct a campaign of flight tests with the full system. In addition to installation of the high-power lasers, we will continue integration, ground, and flight test activities in fiscal year 2007 to support ABL's low-power beam control/fire control and battle management systems. We will be working towards a lethal demonstration of the weapon system against a boosting ballistic missile in 2008.

We still have many technical challenges with the Airborne Laser. Yet the series of major achievements beginning in 2004, when we achieved first light and first flight of the aircraft with its beam control/fire control system, gives me reason to be optimistic that we can produce an effective directed energy capability. An operational Airborne Laser could provide a valuable boost-phase defense capability against missiles of all ranges.

The Kinetic Energy Interceptor (KEI) is a boost-phase effort in response to a 2002 Defense Science Board Summer Study recommendation to develop a terrestrial-based boost phase interceptor as an alternative to the high-risk Airborne Laser development effort. Last year we focused near-term efforts in our kinetic energy interceptor activity to demonstrate key capabilities and reduce risks inherent in the development of a land-based, mobile, very high acceleration booster. It has always been our view that the KEI booster, which is envisioned as a flexible and high-performance booster capable of defending large areas, could be used as part of an affordable, competitive next-generation upgrade for our midcourse or even terminal interceptors. A successful KEI mobile missile defense capability would improve significantly our ability to protect our allies and friends.

This past year we demonstrated important command, control, battle management, and communications functions required for a boost intercept mission, including the use of national sensor data for intercept operations in the field. The key knowledge point for this program is the demonstration of a very high acceleration booster. We began a series of static firing tests of the first and second stages of the booster and had a successful firing this past January. We plan a flight test to verify the new booster in 2008.

Development of the Multiple Kill Vehicle (MKV) system will offer a generational upgrade to ground-based midcourse interceptors by increasing their effectiveness in the presence of multiple warheads and countermeasures. We are exploiting miniaturization technology to develop a platform with many small kill vehicles to engage more than one object in space. This effort will supplement other innovative discrimination techniques we are developing for use in the midcourse phase by destroying multiple threat objects in a single engagement. In 2005 we made progress in the development of the MKV seeker, but resource constraints and technical shortfalls have caused a delay in this development effort. We are now planning to conduct the

hover test in 2009. Our first intercept attempt using MKV is now scheduled for 2012. We are requesting \$162 million in fiscal year 2007 to continue the MKV development effort.

INTERNATIONAL PARTICIPATION

The global nature of the threat requires that we work closely with our allies and friends to develop, field, and operate missile defenses. We have made significant progress in fostering international support for the development and operation of a Ballistic Missile Defense System capable of intercepting ballistic missiles of all ranges in all phases of flight. We have been working closely with a number of allies and friends of the United States to forge international partnerships. I would like to highlight a few of our cooperative efforts.

The Government of Japan continues to make significant investments toward the acquisition of a multilayered BMD System, with capability upgrades to its Aegis destroyers and acquisition of the Standard Missile-3 interceptor. We have worked closely with Japan since 1999 to design and develop advanced interceptor components. This project culminated in the flight test of an advanced SM-3 nosecone earlier this year and ended this phase of our joint cooperative research. Additionally, the MDA and Japan have agreed to co-develop a Block IIA version of the SM-3 missile, which will significantly improve the kinematics and warhead capability. We also have agreed to deploy an X-band radar to Japan, which will enhance regional and homeland missile defense capabilities. In addition, Japan and other allied nations continue upgrading their Patriot fire units with Patriot Advanced Capability-3 missiles and improved ground support equipment.

In addition to the Fylingdales radar development and integration activities, we are undertaking a series of cooperative technical development efforts with the United Kingdom. Newly installed situational awareness displays in the United Kingdom also are indicative of our close collaboration with our British allies in the missile defense area.

Last year we signed an agreement with Denmark to upgrade the radar at Thule and integrate it into the system. This radar will play an important role in the system by providing additional track on hostile missiles launched out of the Middle East.

We will continue to expand cooperative development work on sensors and build on our longstanding defense relationship with the government of Australia. In April 2005 we concluded a Research, Development, Test and Evaluation agreement to enable collaborative work on specific projects, including high frequency over-the-horizon radar, track fusion and filtering, distributed aperture radar experiments, and modeling and simulation.

We are continuing work with Israel to implement the Arrow System Improvement Program and enhance its capability to defeat longer-range ballistic missile threats emerging in the Middle East. This past December Israel conducted a successful launch and intercept of a maneuvering target using the Arrow missile. The United States and Israel are coproducing components of the Arrow interceptor missile, which will help Israel meet its defense requirements more quickly and maintain the U.S. industrial work share.

We also have been in discussions with several allies located in or near regions where the threat of ballistic missile use is high for the forward placement of sensors, and we continue to support our North Atlantic Treaty Organization (NATO) partners in conducting a feasibility study to examine potential architecture options for defending European NATO population centers against longer-range missile threats. This work builds upon ongoing work to define and develop a NATO capability for protection of deployed forces. We have other international interoperability and technical cooperation projects underway and are working to establish formal agreements with other governments.

CLOSING

Mr. Chairman, I want to thank this committee for its continued support of the Missile Defense Program. When I appeared before you last year, we faced numerous challenges. Over the past year, the dedicated men and women of the MDA and our industrial partners met these challenges head-on and overcame the difficulties we experienced in 2004 and early in 2005. The result was that in 2005 we made significant progress. We had a series of successful tests that are unparalleled in our development efforts to date. In 2006 and 2007 I am confident that we will continue this success. I am proud to serve with these men and women, and the country should be grateful for their unflagging efforts.

There have been many lessons learned, and I believe the processes are in place to implement them as we field follow-on increments of the system. I also believe that our program priorities foster long-term growth in multilayered and integrated capabilities to address future threats. There certainly are risks involved in the development and fielding activities. However, I believe we have adequately structured the program to manage and reduce those risks using a knowledge-based approach that requires each program element to prove that it is worthy of being fielded.

Thank you and I look forward to your questions.

Senator SESSIONS. Lieutenant General Dodgen, Commander of Space and Missile Defense Command, and responsible for Strategic Command's Integrated Missile Defense. So, you're the customer of General Obering's product?

**STATEMENT OF LTG LARRY J. DODGEN, USA, COMMANDER,
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND, U.S.
ARMY FORCES STRATEGIC COMMAND**

General DODGEN. Yes, sir.

Senator SESSIONS. We're pleased to hear from you.

General DODGEN. Mr. Chairman, members of the Strategic Forces Subcommittee, thank you for your ongoing support of our military and for the opportunity to appear before this distinguished panel once again. This committee continues to be a great friend of the Army and the Missile Defense Community, particularly in the efforts to field missile defense forces to our Nation and our allies.

I appear before this subcommittee in two roles, as stated by you Senator Sessions. The first is a warfighting member of the Joint Missile Defense Team, I am the Commander of the Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD). Part of the United States Strategic Command, the JFCC-IMD is a joint user representative working closely with the MDA, other Services, and combatant commanders to ensure that our national goal of developing, testing, and deploying an integrated MDS are met. In other words, sir, we operationalize the system, and turn that over to the geographical combatant commanders.

The second, as the Army proponent for missile defense and proponent for the GMD system. Today I will focus my remarks and my role as Commander of the JFCC-IMD, and also provide my view of the BMD threat.

Regarding that threat, this committee has previously heard from other departments, civilian leaders, and combatant commanders about the need to ensure that our country has an operational, robust, and flexible and integratable BMD capability against a growing and increasingly complex ballistic missile. The pace of global proliferation of ballistic missile technology is increasing, as the IC notes several countries producing ballistic missiles are selling that technology to other countries that in turn are modifying, using increasingly sophisticated systems to fit their own needs. We must devalue ballistic missiles as tools of extortion and aggression, undermining any confidence our adversaries might have in threatening us or our allies. I strongly believe that continued development and fielding of our Nation's ballistic missile systems must stay ahead of the threat faced by combatant commanders.

In my role as the JFCC-IMD Commander, I directly support the STRATCOM combatant commander in planning the global missile defenses. JFCC-IMD was established in January 2005, reaching

full operational capability just this past February 28 as one of supporting STRATCOM's new triad concept. IMD is truly joint, manned by Army, Navy, Air Force, and Marine Corps personnel and is headquartered at the Joint National Integration Center at Schriever Air Force Base in Colorado. This arrangement allows us to leverage the existing robust infrastructure and our strong partnership with the MDA to execute the IMD mission.

In the past year, the JFCC-IMD has aggressively executed the global mission to plan, coordinate, and integrate missile defenses. In collaboration with geographical combatant commands, we are developing IMD plans that integrate theater and national assets to provide the best protection.

The STRATCOM, in partner with MDA and Service combatant commanders are setting the stage to evolve the Ballistic Missile Defense Systems (BMDS) beyond its current capability, to provide a more robust missile defense for homeland and deployed forces.

Mr. Chairman, the Army is a full contributing member of the joint BMD team, Army soldiers are trained, ready, and operating the GMD System at Fort Greely, Alaska, and Schriever Air Force Base, Colorado. Just a couple of years ago, we activated the GMD Brigade in Colorado Springs, Colorado, and the subordinate battalion at Fort Greely. These soldiers, as part of the joint team, are our Nation's first line of defense against any launch of an intercontinental ballistic missile toward our homeland. I am proud to represent them along with other members of the Army's Air and Missile Defense Community to develop and field BMDs for our Nation, the deployed forces, friends, and allies. With the ongoing support of this committee, the Army will continue to transform to support the Army's future force, the Joint Integrated Air and Missile Defense System, and our global BMDS.

I appreciate having the opportunity to speak of these important matters, and look forward to addressing any questions you or the members of your subcommittee may have. I also respectfully request that my written statement be submitted for the record. Thank you, sir.

[The prepared statement of General Dodgen follows:]

PREPARED STATEMENT BY LTG LARRY J. DODGEN, USA

INTRODUCTION

Mr. Chairman, Senator Nelson, and members of the Strategic Forces Subcommittee, thank you for your ongoing support of our military and for the opportunity to appear before this distinguished panel, once again. This committee continues to be a great friend of the Army and the missile defense community, particularly in our efforts to field missile defense forces for the Nation and our allies. I consider it a privilege to be counted in the ranks with Mr. Flory, Mr. Duma, and Lieutenant General Obering as advocates for a strong global missile defense capability.

I appear before this committee in two roles. The first is as an Army Commander for missile defense and a proponent for the Ground-based Midcourse Defense (GMD) System. The second is as a soldier in the Joint Missile Defense Team and Commander of the Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD), a part of the United States Strategic Command (STRATCOM), and the joint user representative working closely with the Missile Defense Agency (MDA), other Services, and combatant commanders to ensure that our national goals of developing, testing, and deploying an integrated missile defense system (IAMD) are met.

Mr. Chairman, as I reported last year, Army soldiers are trained, ready, and operating the GMD System at Fort Greely, Alaska, and the Joint National Integration Center (JNIC) at Schriever Air Force Base in Colorado. Just a couple of years ago, we activated the GMD Brigade in Colorado Springs, Colorado, and a subordinate GMD Battalion at Fort Greely. These soldiers, as part of the Joint team, are our Nation's first line of defense against any launch of an intercontinental ballistic missile (ICBM) toward our shores. I am proud to represent them along with the other members of the Army's Air and Missile Defense (AMD) community.

USSTRATCOM JFCC-IMD

The JFCC-IMD was established in January 2005 as one element of USSTRATCOM and reached full operational capability on early in 2006. This organization complements the capabilities inherent in other STRATCOM JFCCs and Joint Task Forces (JTFs) which plan, coordinate, and integrate STRATCOM's other global missions of Space and Global Strike, Intelligence Surveillance and Reconnaissance (ISR), Net Warfare and Global Network Operations, and the newest element, the STRATCOM Center for Combating Weapons of Mass Destruction (WMDs).

The JFCC-IMD is manned by Army, Navy, Air Force, and Marine Corps personnel. It is headquartered at the JNIC at Schriever Air Force Base, Colorado. This arrangement enables us to execute the IMD mission by leveraging the existing robust infrastructure and our strong partnership with our collocated MDA team.

In the past year, STRATCOM, through the JFCC-IMD, has aggressively executed its mission to globally plan, coordinate, and integrate missile defense. In collaboration with geographic combatant commands, we are developing IMD plans within a regional area of operations in the context of STRATCOM's global mission instead of individual theater plans.

Based on guidance from the Commander, STRATCOM, we have also developed plans to take existing MDA assets, currently in test and development status, and rapidly transition them, in an emergency, to an operational warfighting capability. This allows STRATCOM to provide additional critical IMD capabilities to the combatant commands in times of crisis. Examples of this capability include early activation and deployment of the AEGIS SM3 Missile and the sea-based and Forward Based X-band Transportable (FBX-T) Radar to operational locations in the Pacific region, where, by the end of 2006, they will join a global network of radars. STRATCOM initiated planning efforts to integrate the capabilities of all the JFCCs to support the "New Strategic Triad," as it determines the next steps needed to fulfill our commitment to an integrated missile defense capable of defending the U.S., its deployed forces, friends, and allies.

JFCC-IMD works closely with the other JFCC elements of STRATCOM and the combatant commands to make Offense-Defense Integration, ISR, and the other mission areas integral aspects of how we fight, to ensure the optimal application of limited resources.

The IMD community, led by the STRATCOM Commander and his Unified Command Plan Authority, has conducted numerous capability and readiness demonstrations, integrated flight and ground tests, and combatant command exercises to develop and validate the operators' tactics, techniques, and procedures. As we work toward our system's future operational capability, increased warfighter involvement in the testing and exercising of the Ballistic Missile Defense System (BMDS) ensures both the viability of the defense and the confidence of its operators.

STRATCOM, through the JFCC-IMD, is leading the planning of global missile defenses with the development of the global IMD Concept of Operations (CONOPs). The CONOPs relies on the development and coordination of engagement sequence groups (ESGs) and the advocacy of desired global missile defense characteristics and capabilities.

STRATCOM-developed global IMD CONOPs serves as a roadmap for the warfighting community to guide the development of more detailed IMD planning and execution. These CONOPs contains two fundamental principles. First, the geographic component commanders execute the IMD fight within their Areas of Responsibility (AORs). Second, multi-mission sensors are centrally tasked by STRATCOM Commander to optimize their use in forming ESGs.

As a key requirement for IMD planning, the identification of ESGs as the optimal pairing of sensor and weapon capabilities required to provide active missile defense for the designated defended area is critical. The ESGs are a tool the IMD community uses to help operate the BMDS by balancing operational necessity with the realities of ongoing research, development, and testing in the near term. As more elements and components are made available, ESGs will serve to optimize our global missile defense system.

The STRATCOM commander represents all the component commands as the advocate for IMD. He executes this responsibility at two levels. First, for those elements already deployed, headquarters, STRATCOM J8, in collaboration with the JFCC-IMD, conducts the Warfighter Involvement Process (WIP) to evaluate the adequacy of the current capabilities of the BMDS. This process can encompass anything from identifying simple human interface changes or modifications to developing refined planning tools. These needs are prioritized by STRATCOM for review and approval and are provided to MDA for consideration. The second level of advocacy focuses on future capability needs. These future elements and components will provide additional capabilities that enable a more robust, reliable, and capable system.

The critical element that ties the entire BMDS system together is the Command and Control Battle Management Communications (C2BMC). C2BMC is an essential evolutionary component of the BMDS that will greatly enhance both planning and execution capabilities. C2BMC contributes to all phases of BMD from optimizing planning to synchronizing the automated execution of the BMDS. Upgrades to the Command, Control, Battle Management, and Communications System will extend situational awareness capability to Pacific Command (PACOM) and European Command (EUCOM) by the end of 2006.

As our planning processes have matured over the past year, JFCC-IMD's innovative use of new collaborative planning capabilities in major combatant command exercises has demonstrated the effectiveness of distributed crisis action planning. JFCC-IMD was able to support the combatant commands with development of new defense designs and optimized locations for BMDS in exercises such as STRATCOM's Global Lightning and PACOM's Terminal Fury.

Through our partnership with MDA, the Services, and the warfighters at the combatant commands, STRATCOM is setting the stage to evolve the BMDS beyond its current capability to that of providing more robust missile defense for the homeland, deployed forces, friends and allies. We are actively engaged with MDA and the Services in the development and deployment of BMDS elements and components ensuring a layered, multi-phase operational capability for the combatant commands.

Air and Missile Defense—an Overview of the Fiscal Year 2007 Army Budget Submission

In addition to deploying a GMD system, MDA, the Services, and the combatant commanders are focused on improving Theater Air and Missile Defense (TAMD) capabilities within the context of the evolving BMDS in Integrated Air and Missile Defense (IAMD) Joint Integrating Concept. Both GMD and TAMD systems are vital for the protection of our homeland, deployed forces, friends, and allies. Air and missile defense is a key component in support of the Army's core competency of providing relevant and ready land power to combatant commanders.

I would now like to focus on the Army's fiscal year 2007 budget submission for Air and Missile Defense (AMD) systems. The President's budget, presented to Congress on February 6, includes approximately \$1.57 billion with which the Army proposes to perform current Army AMD responsibilities and focus on future development and enhancements of both terminal phase and short-range AMD systems. In short, the Army is continuing major efforts to improve the ability to acquire, track, intercept, and destroy theater air and missile threats.

The Army, as part of the joint team, is transforming its AMD forces to meet the increasingly sophisticated and asymmetric threat environment encountered by the joint warfighter. The Army has the lead to conduct the IAMD Capabilities Based Assessment. This analysis will comprise the front end of the Chairman of the Joint Chiefs of Staff Joint Capabilities Integration Development System. The study will identify key joint, agency and combat command IAMD capability gaps and will recommend doctrine, organization, training, materiel, leadership and education, personnel and facilities (DOTMLPF) transformation actions. The document is envisioned to fulfill time-phased IAMD needs across the range of military operations.

INTEGRATED AMD SYSTEM OF SYSTEMS

The Army is transforming its Air Defense Force from its current separate systems architecture to a component-based, network-centric, IAMD System of Systems (SoS). The IAMD SoS program focuses on systems integration, common battle command and control, joint enabling networking, and logistics and training, to ensure operational requirements, such as force protection, lethality, survivability, transportability and maneuverability are achieved. The IAMD SoS program will employ an evolutionary acquisition strategy consisting of a series of increments leading to the objective capability. This SoS approach calls for a restructuring of systems into components of sensors, weapons and Battle Management Command, Control, Commu-

nications, Computers, and Intelligence (BMC4I) with a standard set of interfaces among these components using a standardized set of networks for communication.

Technology insertions to the IAMD SoS will continue throughout each increment as high-payoff technologies mature and are ready for integration. Incremental development of the IAMD SoS allows the Army to field new or improved capabilities to warfighters faster, by producing and deploying systems and components as the technologies mature. Funding in the proposed fiscal year 2007 President's budget supports the first steps in achieving an IAMD SoS architecture.

AIR AND MISSILE DEFENSE BATTALIONS

As part of Air Defense Transformation, the Army is creating composite AMD battalions. These battalions address capability gaps, which permit us to defeat cruise missiles and unmanned aerial vehicles (UAVs) while maintaining our ability to defend critical assets from the ballistic missile threat. The composite AMD battalions will capitalize on the synergies of two previously separate disciplines: short-range air defense and high-to-medium altitude air defense. The current plan is to organize eight battalions as Patriot-pure units, four battalions as AMD battalions, and create one battalion, in Korea, as a maneuver AMD battalion. This transformation is underway.

Within the context just provided, allow me to briefly discuss each of the programs that support the Army's AMD Transformation.

TERMINAL PHASE BALLISTIC MISSILE DEFENSES

The Patriot/Medium Extended Air Defense System (MEADS) capability is designed to counter theater ballistic missile threats in their terminal phase in addition to cruise missiles and other air-breathing threats. Combining these systems with the Theater High Altitude Area Defense (THAAD) System capability being developed by MDA with a planned fielding in fiscal year 2009, brings an unprecedented level of protection against missile attacks to deployed U.S. forces, friends, and allies well into the future.

Patriot/PAC 3 and Meads Overview

Mr. Chairman, since the combat debut of the Patriot AMD System during Operation Desert Storm, the Army has continued to implement a series of improvements to address the lessons learned. During Operation Iraqi Freedom (OIF), we saw the debut of the improved Patriot Configuration-3 system, including the effective use of the Guidance Enhanced Missile and the Patriot Advanced Capability 3 (PAC-3) Missile. PAC-3 is the latest evolution of the phased materiel improvement program to Patriot. Combining developmental testing and operational data, this program has enabled the development and deployment of a new high-velocity, hit-to-kill, surface-to-air missile with the range, accuracy, and lethality necessary to effectively intercept and destroy more sophisticated ballistic missile threats. Today's Patriot force is a mixture of PAC-2 and PAC-3 configured units. To maximize the full advantage of the PAC-3 capabilities, the Army is moving toward pure-fleeting the entire Patriot force to the PAC-3 configuration.

As I highlighted last year, Patriot saved many lives when defending against Iraqi ballistic missile attacks during OIF. However, there were some operational deficiencies. The Army has undertaken steps to correct them and address lessons learned. The Army has pursued two thrusts—identification and execution of a \$41.6 million program for nine specific OIF fixes and continued aggressive participation in joint interoperability improvements in situational awareness. All funded OIF fixes are on schedule to be completed by the end of fiscal year 2007, pending any materiel release issues.

The Patriot system remains the Army's mainstay TAMD system and our Nation's only deployed land-based short-to-medium range BMDS capability. The current Patriot force must be maintained through sustainment and recapitalization efforts, until the MEADS is fielded, projected to begin in 2015.

MEADS is a cooperative development program with Germany and Italy, to collectively field an enhanced ground-based AMD capability. The MEADS program, which supports the President's goal for international cooperation in missile defense, will enable the joint integrated AMD community to move beyond the critical asset defense designs we see today. MEADS will provide theater level defense of critical assets and continuous protection of a rapidly advancing maneuver force as part of a Joint IAMD architecture. Major MEADS enhancements include 360-degree sensor coverage, a netted and distributed battle manager that enables integrated fire control, and a strategically deployable and tactically mobile, AMD system. While the PAC-3 missile is the baseline missile for the international MEADS program, the

Missile Segment Enhancement (MSE) missile is being developed to meet U.S. operational requirements. MSE will provide a more agile and lethal interceptor that increases the engagement envelope.

Combined Patriot/MEADS Approach

With the approval of the Defense Acquisition Executive, the Army embarked on a path to merge the Patriot and MEADS programs, establishing the Patriot/MEADS Combined Aggregate Program (CAP) with the objective of achieving the MEADS capability through incremental fielding of MEADS major end items into Patriot. Patriot/MEADS CAP is an important capability that will operate within MDA's BMDS. It is in fact, the number one Army priority system for defense against short and medium-range Tactical Ballistic Missiles and air breathing threats (i.e. cruise missiles and UAVs). The Patriot/MEADS CAP will be capable of operating within a joint, interagency, and multinational interdependent operational environment. It will provide wide-area protection at strategic, operational, and tactical levels.

Patriot/MEADS CAP will also provide BMC4I, introduce lightweight deployable launchers, upgrade the PAC-3 missile, and eventually provide the full MEADS capability to the entire force. The MEADS system offers a significant improvement in the ability to deploy strategically while maintaining tactical mobility. The system uses a netted and distributed architecture with modular and configurable battle elements, which allows for integration with other Army and Joint sensors and shooters. These features and capabilities will allow MEADS to achieve a robust 360-degree defense against all airborne threats. By establishing the CAP, the joint integrated AMD architecture has become more robust. First, MEADS enhancements are integrated into the existing system. Second, as lessons are learned from the present missile defense capability, they will be incorporated into the MEADS follow-on system. We are confident that this path will provide our servicemembers, allies, friends, and the Nation with the most capable AMD system possible.

The Army and the entire missile defense community continue to strive to improve our Nation's missile defense capabilities. The Patriot and PAC-3/MEADS CAP research, development, and acquisition budget request for fiscal year 2007 is approximately \$916.5 million. This request procures 108 PAC-3 missiles, purchases spares for the system, and reflects the necessary Patriot development to keep the system viable as we pursue development of PAC-3/MEADS CAP capabilities.

CRUISE MISSILE DEFENSE

In the world today, there exists a real and growing threat from land attack cruise missiles. Cruise missiles are inherently very difficult targets to detect, engage, and destroy because of their small size, low detection signature, and low altitude flight characteristics. When armed with a WMD warhead, the effect of a cruise missile could be catastrophic. It is clear that the required systems and capabilities necessary to counter this emerging threat need to be accelerated to field a cruise missile defense (CMD) capability as soon as possible. The Army's CMD program is an integral piece of the Joint Cruise Missile Defense architecture, and we are proud of our contributions to this effort. Critical Army components of the Joint CMD architecture are provided by the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS), the Surface-Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM), and an integrated fire control capability. We are also working closely with the Joint community to assure development of doctrine that synchronizes our military's full capabilities against the cruise missile threat.

JLENS Overview

JLENS brings a critically needed capability to address the growing CM threat. To support an elevated sensor, the JLENS program is developing unique lightweight fire control and surveillance radars to detect, track, and identify CM threats. JLENS will support engagements using the SLAMRAAM/Complementary Low Altitude Weapon System (SLAMRAAM/CLAWS), Navy Standard Missile, and Patriot/MEADS weapon systems. JLENS uses advanced sensor and networking technologies to provide precision tracking and 360-degree wide-area, over-the-horizon surveillance of land-attack cruise missiles. The fiscal year 2007 JLENS funding request of \$264.5 million supports development of a full JLENS capability, with the first unit equipped by 2011.

SLAMRAAM Overview

SLAMRAAM will provide a CMD system to maneuver forces with an extended battlespace and a beyond line-of-sight, non-line-of-sight engagement capability critical to countering the CM threat, as well as UAV threats. SLAMRAAM uses the existing Joint AMRAAM missile currently used by the Air Force and the Navy, there-

by capitalizing on the Joint harmony that the Department of Defense (DOD) is striving to achieve. The Army and the Marine Corps are also executing a joint cooperative development for SLAMRAAM/CLAWS to meet the needs of soldiers and marines in homeland defense as well as overseas deployments. The fiscal year 2007 funding request of \$49 million supports the scheduled Initial Operational Capability (IOC) target of 2011.

Sentinel Radar Overview

The Sentinel Radar is an advanced, three-dimensional, phased array air defense radar and a critical component in the Army's ability to conduct air surveillance for the maneuver force. Sentinel is a small, mobile battlefield radar that supports the joint air defense sensor network in detecting cruise missiles, UAVs, and helicopter threats, thereby contributing directly to the overall Single Integrated Air Picture (SIAP) and supporting multiple Homeland Defense missions. Its Enhanced Target Range and Classification (ETRAC) radar upgrades will enable it to support engagements at extended ranges and reduce the time required to perform target classification. Additionally, these upgrades support next generation combat identification for friendly air, thereby reducing the possibility of fratricide and providing an enhanced positive friendly and civil aviation identification capability. The fiscal year 2007 funding request of \$17.6 million provides for joint identification and composite sensor netting development efforts, four ETRAC system upgrade kits, and development and integration of improvements to support joint interoperability.

AIR, SPACE, AND MISSILE DEFENSE COMMAND AND CONTROL

The Army is increasing its command and control capabilities on the battlefield. The Army's Air and Missile Defense Commands (AAMDCs) will help integrate TAMDC operations, by integrating, coordinating, and synchronizing Joint attack operations, active defense, passive defense, and C4 operations in the theater, and also globally tie into our JFCC-IMD.

Concurrent with the creation of AMD composite battalions, the Army has developed, and is now in the process of fielding, air defense airspace management (ADAM) cells throughout the force. ADAM cells will perform four missions: plan AMD coverage, contribute to third-dimension situation awareness and understanding, provide airspace management, and integrate operational protection. With an emphasis on receiving and sharing the joint air picture from multiple sources and assets through the battle command network, ADAM cells will provide commanders with situational awareness as well as the traditional friendly and threat air picture, enabling commanders to effectively manage their aerial assets. ADAM cells are already being fielded to the Army to meet modularity requirements, with two ADAM cells at the division headquarters and one to every brigade in the Army, to include both the Active and Reserve Forces. This high-priority system has been supported through supplemental appropriations to this point. The fiscal year 2007 funding request of \$49.5 million provides 15 ADAM Cells for the Active and Reserve components.

Also in the past year, the Army activated the 94th Air and Missile Defense Command, supporting the U.S. Pacific Command (PACOM) theater of operations. With the 94th AAMDC activation, there are three Army AMD Commands; two in the active component and one in the Reserve component. The 94th AAMDC, designed for joint and multinational operations, will provide for missile defense in the Pacific theater and will assist in planning theater-level air and missile defenses. The 94th AAMDC will provide the PACOM commander with a more robust theater-based capability. Moreover, the unit's presence in the Pacific adds depth, because its capability will be readily available to the warfighting commander.

The Joint Tactical Ground Stations (JTAGS), forward deployed today in European Command (EUCOM), Central Command (CENTCOM), and PACOM, are providing assured missile warnings to combatant commanders and assigned forces through a direct downlink from space-based infrared assets into the joint theater communications architecture. In addition to protecting the deployed force, these systems alert the BMDS architecture and enhance attack operations. The fiscal year 2007 funding request of \$24.9 million sustains the forward deployed JTAGS units supporting joint warfighters and postures the Army to participate with the Air Force in a future ground mobile system compatible with the Space-Based Infrared System (SBIRS) and follow-on sensors. The planned Multiple Mission Mobile Processor (MP3) Program is being restructured due to the delays in the SBIRS schedule.

COUNTER-ROCKET, ARTILLERY, MORTAR (C-RAM)

A significant danger in OIF/OEF today is posed by insurgents employing indirect-fire tactics of quick-attack, low-trajectory, urban-terrain-masked rocket, artillery, and mortar (RAM) strikes against U.S. forward operating bases in Iraq. To combat this threat, the Army developed C-RAM, an integrated solution of capabilities to provide warning and intercept of RAM threats. C-RAM provides a holistic approach to the Counter-RAM mission. Horizontal integration across the core functions—command and control, shape, sense, warn, intercept, respond and protect—is providing an integrated modular and scalable capability. This capability provides timely warning of mortar attacks, intercept and defeat of incoming rounds, and accurate location of insurgent mortar crews, enabling a rapid, lethal response. C-RAM takes advantage of existing systems and capabilities, combining them in a SoS architecture to support the warfighter on today's battlefield. The current C-RAM solution is truly joint, in that it uses fielded systems from the Army, Navy and Air Force along with a commercial-off-the-shelf (COTS) system. C-RAM has been supported through supplemental appropriations. The Army will request funding for continued C-RAM fielding in the upcoming supplemental request, and the C-RAM program will be included in the Army's POM beginning in fiscal year 2008.

DIRECTED ENERGY INITIATIVES

The Army continues to explore directed energy capabilities for weapon system development and integration into Army Transformation applications. High Energy Laser (HEL) systems have the potential of being combat multipliers, meeting air and missile defense needs in the future and enhancing current force capabilities, such as addressing the RAM threats. The ability of a HEL system to shoot down RAM targets has been repeatedly demonstrated, with mature chemical laser technologies proven by the Tactical High Energy Laser (THEL) program.

Meanwhile, the Army's fiscal year 2007 science and technology funding request of \$32.8 million supports HEL technology development focused on solid state laser technologies that will offer electric operation and compatibility with the Future Combat System (FCS) by the year 2018. The Army is participating in a Joint high-powered solid state laser program with the Office of the Secretary of Defense High Energy Laser Joint Technology Office and the other Services to pursue several candidate solid state laser technologies with the operating characteristics necessary for weapon system development. In fiscal year 2007, while leveraging the Joint program, the Army is initiating a HEL Technology Demonstrator (HELTD) that will, by fiscal year 2013, have the ability to shoot down RAM threats as a stepping stone toward deployment of HELs in a FCS configuration. Ultimately, HELs are expected to complement conventional offensive and defensive weapons at a lower cost-per-shot than current systems.

CONCLUSION

Mr. Chairman, the Army, a full contributing member of the Joint team, is relevant and ready, fighting the war on terrorism, deployed in Southwest Asia and elsewhere, and deterring aggression throughout the world, while transforming to meet future threats. With its responsibilities for GMD and Patriot/MEADS, the Army is an integral part of the Joint team to develop and field the BMDS in defense of the Nation, deployed forces, friends, and allies. In my role as the Joint Functional Component Commander for Integrated Missile Defense, I will continue the development of a Joint BMDS capability to protect our warfighters and our Nation. The Army has stepped up to the land-attack cruise missile defense challenge by aggressively developing the joint, integrated, and networked sensor-to-shooter architecture necessary to defeat the emerging threat. The fiscal year 2007 budget proposal continues the transformation of the Army's ASMD Force to support the Army's Future Force, the Joint Integrated Air and Missile Defense System, and our global BMDS, building on the ongoing success of our theater AMD force in Operation Iraqi Freedom. Transformation will continue to define the characteristics of the emerging ASMD force and determine how it can best support the Future Force operating in a joint, interagency, and multinational environment.

I appreciate having the opportunity to speak on these important matters and look forward to addressing any questions you or the other committee members may have.

Senator SESSIONS. Thank you, General Dodgen.

Mr. Duma, you are responsible for the testing of the program. We are delighted to hear your remarks at this time, and we will make your full remarks a part of the record.

STATEMENT OF DAVID W. DUMA, ACTING DIRECTOR, OPERATIONAL TEST AND EVALUATION, DEPARTMENT OF DEFENSE

Mr. DUMA. Thank you, Senator. Mr. Chairman, distinguished members of the subcommittee, I'm pleased to have this opportunity to speak with you about the BMDS test program.

As requested by this committee, I will offer my insights on oversight, development, testing, and fielding of BMDs. In doing so, I will cover four areas.

First, I will recap the MDA test accomplishments during the past year; second, I will discuss the organization and test philosophy changes within the MDA; third, I will give you a status of compliance with test requirements prescribed in the recent National Defense Authorization Acts (NDAA); and fourth, I will highlight future challenges facing the test program of the BMDS.

First, the results. The MDA testing program during 2005 was adequate and appropriate to the developmental maturity of the BMDS. The results of ground tests demonstrated that integration into operability, tactics, doctrine, and procedures were adequate to increase confidence in those aspects of the system. For the first time, MDA successfully flew an operationally configured combination of a Raytheon Exoatmospheric Kill Vehicle, integrated onto an Orbital Sciences booster. The successful flight test of threat-representative targets across both the Cobra Dane and Beale Early Warning Radars demonstrated the capability to provide target acquisition, tracking, and queuing data. This test provided significant information regarding the Cobra Dane capabilities and limitations. The Aegis BMDS successfully completed two intercept missions with the new SM-3 missile. One of these flights included the intercept of a separating target. The ABL completed the passive phase of flight test of the Beam Control/Fire Control system, and completed the integration and operational demonstration of six Chemical Oxygen Iodine Laser modules.

The THAAD executed its FT-1 in 5 years, it flew its redesigned missile on a non-intercept test to measure interceptor kinematics and demonstrate performance.

Last year, the Forward-Based X-Band Radar Transportable (FBX-T) demonstrated its ability to track long-range ballistic missile launches. The Sea-Based X-Band Radar completed integration testing in the Gulf of Mexico, and has arrived in Hawaii to begin its checkout and integration into the BMDS test bed.

Overall, the results of the integrated ground test, coupled with the success of other element-level ground and flight test events, indicate the BMDS system is maturing.

Second, the approach. The Department is changing the oversight structure of the BMDS. A BMD Executive Board will replace the Senior Executive Council as the senior oversight body for missile defense activities. The board will review and make recommendations regarding the implementation of strategic policies and plans, program priorities, and investment options. In this new oversight structure, I am a member of that board.

In addition, General Obering implemented several changes in organization and test philosophy during the past year. These changes more tightly integrate the developers, warfighters, and operational

testers and should better integrate the system engineering functions with the test and evaluation functions within MDA. They will also address efforts to address priority items, such as validation and accreditation of models and simulations.

Third, the NDAA—over the last 2 years, Congress has asked MDA and my office to accomplish several specific initiatives with regard to operational testing of the BMDS. The NDAA for Fiscal Year 2004 required operationally realistic testing of the BMDS. This past year, MDA conducted numerous ground tests, war games, and capability demonstrations using trained warfighters to operate the systems. Incorporating trained warfighters into the testing program is added to the operational understanding of the capabilities, limitations, and maturity of the BMDS. In fiscal year 2005, Congress required the MDA to conduct an operationally realistic test of the BMDS. Following two launch failures of the GMD system, and recommendations from two independent review teams, General Obering restructured the flight test program. The restructured program includes two more risk-reduction flights—if they are successful, General Obering plans to conduct operationally realistic flight tests in fiscal year 2007.

In fiscal year 2006 language, Congress required the operational test community to plan and conduct an operational test of the capability provided by each block of the BMDS, beginning with Block 2006. Toward this effort, MDA, the Joint Operational Test Agency, and my office will develop an integrated, evaluation-driven test strategy. This approach should increase the quantity and quality of data, while increasing the efficiencies of test resources. When the evaluation plan is finished, MDA will include these tests in the next revision to the Integrated Master Test Plan.

Fourth, the challenges. The complexity of the BMDS is increasing, and testing the BMDS is becoming more challenging as the Agency adds elements and capability. Testers must assess performance and reliability during concurrent tests and operations of a layered BMDS. Integration of the BMDS elements and sensors that are still maturing, with operational legacy systems is a difficult task. Fusing the data from each element into a single, unambiguous operational picture is a significant software development, integration, and testing challenge. Range safety and environmental restrictions limit intercept geometries to only a few scenarios. Meeting each of these challenges requires a series of well-planned ground and flights tests.

Over the long term, MDA should incrementally develop a capability to support concurrent testing and operations, including simulation over live testing to speed up the process. This is similar to how we upgraded and tested the Cheyenne Mountain without interfering with operations. When developed, this capability will augment the capability for system tests and evaluation to characterize operational effectiveness and suitability, using actual hardware and warfighters in the loop.

Mr. Chairman, in conclusion, MDA experienced a difficult year with its GMD system, but ended the year on several high notes. Element successes indicate they are progressing toward maturity. Last year, warfighters demonstrated that they could operate the integrated ground system. The fact remains, however, that we

ground test for discovery, but we must flight test to verify operational performance and validate simulations. Successful flight tests with repeatable results are the cornerstones for building confidence in the BMDS. Warfighters must have confidence that the system will defend on demand.

Senator, this concludes my opening remarks, and I welcome your questions.

[The prepared statement of Mr. Duma follows:]

PREPARED STATEMENT BY DAVID W. DUMA

Mr. Chairman, distinguished members of the subcommittee, I am pleased to have this opportunity to speak to you about the Ballistic Missile Defense System (BMDS) test program. As requested by this committee, I will offer my insights on oversight, development, testing, and fielding of ballistic missile defenses. In doing so, I will address progress toward fielding those capabilities mentioned for deployment by the President in 2002, including ground-based interceptors, seabased interceptors, and associated sensors. I will cover four areas. First, I will recap the Missile Defense Agency (MDA) test accomplishments during the past year. Second, I will discuss organization and test philosophy changes within MDA. Third, I will give you a status of compliance with test requirements prescribed in recent National Defense Authorization Acts (NDAA). Fourth, I will highlight future challenges facing the test program of the BMDS.

The MDA testing program during 2005 was adequate and appropriate to the developmental maturity of the BMDS.

1. The results of ground tests demonstrated that integration, interoperability, tactics, doctrine, and procedures were adequate to increase confidence in these aspects of the system.

2. For the first time, MDA successfully flew an operationally configured combination of a Raytheon Exoatmospheric Kill Vehicle integrated onto an Orbital Sciences booster. While the flight was successful, it did not evaluate the fixes to the ground support system that caused the previous flight test launch failures. Plans are to demonstrate the ground system fixes in subsequent flight-testing.

3. The successful flight of threat representative targets across both the Cobra Dane and Beale Early Warning Radars search and track volume demonstrated the capability to provide target acquisition, tracking, and cueing data. MDA executed an operationally realistic test scenario that provided significant information regarding the Cobra Dane capabilities and limitations. MDA also demonstrated they could successfully launch a long-range threat representative target from an air platform.

4. The Aegis Ballistic Missile Defense System successfully completed two intercept missions with the new SM-3 missile. One of these flights included an intercept of a separating target.

5. The Airborne Laser completed the passive phase of flight test of the Beam Control/Fire Control system, and completed the integration and operational demonstration of six integrated Chemical Oxygen Iodine Laser modules.

6. The Terminal High Altitude Area Defense (THAAD) system successfully executed its first flight test in 5 years. It flew its redesigned missile on a nonintercept test to measure interceptor kinematics and demonstrate performance.

7. Last year, two new sensors completed integration and some combined developmental and operational testing. The Forward-Based X-band Radar-Transportable (FBX-T) demonstrated its ability to track long-range ballistic missile launches. The SeaBased X-band radar completed integration testing in the Gulf of Mexico and has arrived in Hawaii to begin its checkout and integration into the BMDS test bed.

The results of the integrated ground tests, coupled with the success of other element-level ground and flight test events, indicate the BMDS is maturing.

The Department of Defense (DOD) is changing the oversight structure of the BMDS. A Ballistic Missile Defense Executive Board will replace the Senior Executive Council as the senior oversight body for missile defense activities. It will not have the decision authority of the Senior Executive Council, however. The board will review and make recommendations regarding the implementation of strategic policies and plans, program priorities, and investment options. This change implements

management and governance principles set for the in the Quadrennial Defense Review (QDR). In this new oversight structure, I am a member of the board. My Deputy for Missile Defense will co-chair the Test and Evaluation Standing Committee.

In addition, General Obering implemented several changes in organization and test philosophy during the past year. These changes more tightly integrate the developers, warfighters, and operational testers. They should also better integrate the system engineering functions with the test and evaluation functions within MDA. These changes, coupled with improvements in test planning, execution, and analyses, should result in better definition of data requirements and better, more efficient test execution.

As part of re-engineering his agency, General Obering established the Responsible Test Organization and Combined Test Force under the leadership and direction of his Deputy for Test and Assessment. The Combined Test Force will plan and execute tests, and collect and analyze data that will populate a database to support the technical and operational evaluations of BMDS performance. The Combined Test Force will include test personnel from each of the BMDS elements and the Operational Test Agencies.

With the support of General Obering, I have commissioned the Institute for Defense Analyses to examine and recommend a construct that integrates the operational testers into the Combined Test Force. The goal is to maintain the operational testers' independence and credibility while economizing resources, eliminating duplication of effort, and supporting Combined Test Force mission and objectives. General Obering and I have also asked the Institute to investigate and recommend how to best integrate each stakeholder's assessment needs into the test planning, execution, data collection, analysis, and evaluation processes. This should further streamline the test and evaluation planning and execution process, while ensuring all stakeholders efficiently and effectively meet their objectives.

Along with these organizational changes, MOA and the operational test community have agreed on an integrated test planning approach for future BMDS Blocks that supplements the Integrated Master Test Plan. The current Integrated Master Test Plan covers the next 2 years of testing and emphasizes BMDS testing that is operationally realistic. Beginning with Block 2006, MDA, the joint operational test agency, and my office will develop an integrated, "evaluation-driven" test plan. This test planning philosophy brings discipline and structure to planning Block testing based upon overall system evaluation needs, while concurrently addressing individual element test requirements. This approach should increase the quantity and quality of data while increasing the efficient use of test resources. It will also enhance efforts to address priority issues, such as verification, validation, and accreditation of models and simulations.

Over the last few years, Congress has asked MDA and my office to accomplish several specific initiatives with regard to operational testing of the BMDS. The NDAA for Fiscal Year 2004 required operationally realistic testing of the BMDS. This past year, MDA conducted numerous ground tests, war games, and capability demonstrations using trained warfighters to operate the systems. These exercises included fully integrated ground and simulated missions designed by the operational testers and warfighters. This year's update to the Integrated Master Test Plan incorporates greater operational realism in the areas of increased warfighter involvement in flight tests; more end-to-end system testing; use of operationally representative missiles; employment of operational tactics, techniques, and procedures; and inclusion of more complex countermeasures. Incorporating trained warfighters into the testing program has added to the operational understanding of the capabilities, limitations, and maturity of the BMDS.

In fiscal year 2005, Congress required the MDA to conduct a realistic operational test of the BMDS. Following two launch failures in the Ground-based Midcourse Defense system and recommendations from two independent review teams, General Obering restructured the flight test program. Flight-testing to date has not yet reduced the risk to the point where General Obering is ready to execute an operationally realistic flight test. The restructured program includes two more risk reduction flights. If they are successful, General Obering plans to conduct an operationally realistic flight test later this year.

In fiscal year 2006, Congress required the operational test community to plan and conduct an operational test of the capability provided by each block of the BMDS beginning with Block 2006. I have taken action to begin this effort involving not only the operational test community, but also the warfighters and MDA. When the evaluation plan is finished, MDA will include these tests in the next revision of the Integrated Master Test Plan.

The complexity of the BMDS is increasing. Elements are maturing and being integrated into the system. Consequently, testing the BMDS is becoming more chal-

lenging as the MDA adds elements and capability. Testers must assess performance and reliability during concurrent test and operations of a layered BMDS. Integration of the BMDS elements and sensors that are still maturing with operational legacy systems is a difficult task. Fusing the data that each element provides into a single, unambiguous operational picture is a significant software development, integration, and testing challenge. Range safety and environmental restrictions limit intercept geometries to only a few scenarios. Meeting each of these challenges is a big task—one that requires a series of well-planned ground and flight tests.

Over the long term, MDA should incrementally develop a capability to support concurrent testing and operations, including simulation over live testing, to speed up the process. This is similar to how we upgraded and tested Cheyenne Mountain without interfering with operations. When developed, this capability will provide an alternative means for system test and evaluation to characterize operational effectiveness and suitability using actual hardware and warfighters in the loop.

Mr. Chairman, in conclusion, MDA experienced a difficult year with its Ground-based Midcourse Defense system, but ended the year on several high notes. Element successes indicate they are progressing toward maturity. Last year, warfighters demonstrated they could operate the integrated ground system. The fact remains, however, that we ground test for discovery, but we must flight test to verify operational performance and validate simulations. Successful flight tests are the cornerstones for building confidence in the BMDS. Warfighters must have confidence the system will defend on demand.

This concludes my opening remarks and I welcome your questions.

Senator SESSIONS. Thank you, Mr. Duma. I will yield my time here to Senator Roberts, chairman of the Senate Select Committee on Intelligence, and a valuable member of our committee.

Senator ROBERTS. Mr. Chairman, that's very kind of you.

Gentlemen, we thank you all for the service you are providing to protect our country, we ask you to persevere. Thank you for taking the time out of your very valuable schedule to come before us, and thank you, Mr. Chairman, for holding this extremely valuable subcommittee meeting.

The scene was the Emerging Threats and Capabilities Subcommittee—Mr. Chairman, it was before September 11—and we had a very prestigious panel, I think Jean Kirkpatrick was one, I'm trying to remember the others, and I asked them on emerging threats, as this was prior to September 11 you have to remember, "what keeps you up at night?" Of course, everybody was concerned after the U.S.S. *Cole*, and after the embassy bombings, and after the 1993 attempt on the World Trade Center about the attack on the Homeland. It was Jean Kirkpatrick who said "access denial," in other words that a person who has a ballistic missile, or a person who has an intercontinental missile could basically tell the world, "We have certain national objectives,"

I think Iran would be a classic example, "that if you cross into our territory, there will be hell to pay." Access denial was a big issue with me at that particular time, especially since Secretary Flory, you indicated now 25 countries have that capability, and we're somewhere between 5 and 9 and growing. In regards to an ICBM, when you get a guy like Ahmadinejad, the President of Iran, saying what he says—which is rather incredulous to the western press—I think you have to take it seriously, I think we have a real problem.

Now given that, General Obering, in regards to access denial and what we can do about it, I would like to start with the topic you and I have discussed, and that's the continued development of the ABL. Last year the MDA did decimate the ABLS, the primary

boost phase system. What does it mean when the ABL is the primary boost phase interceptor?

General OBERING. Senator, what that means is that from a flexibility perspective, the ABL can address multiple ranges of missiles with that capability, that's very revolutionary capability. From operational standoff distances, that is an advantage that it has over the KEI, which is our other boost phase alternative, and so from a flexibility standpoint, it has the most capability overall. Also, it had demonstrated two basic technical capabilities to operate, otherwise it had achieved the full duration lase, it had reached an operational power setting, we had gotten the initial beam control/fire control flights on the aircraft, and so we felt like it was making sufficient technical progress based on the knowledge points we had designed for the system, that had become that candidate. The KEI, which was the alternative, was originated based on a Defense Science Board 2002 recommendation as an alternative for that.

Senator ROBERTS. So you would still say the ABL is considered the primary boost phase interceptor?

General OBERING. Yes, I haven't changed from that.

Senator ROBERTS. All right. Over the last couple of years, the ABL has met every major milestone, as you've indicated, you've tested many. But I sort of browbeat the chairman into letting you say, were the knowledge points scheduled, including the combining lasing power for all six laser modules extensive post-modification flight test and testing the laser at near full power, and your answer is yes, this is the case. I think I'm putting words in your mouth. Do you have any reason to believe the ABL will not continue to reach the scheduled milestone toward the knowledge points, up to and including the lethal shoot down in 2008?

General OBERING. At this time, no, sir, they are making steady progress through the installation of the lasers, and the preparation of the aircraft for the series of active ground tests that will start this summer and the flight tests in the fall. Having said that, we still have an awful lot of work to do, there are still some major integration challenges. There's two things that catch my attention when somebody says, "Well, we're just re-using software," and "all it is is integration," both of those should raise red flags. It's not that we have many red flags to raise, but we have a lot of integration activities to continue in that program, so I believe that there is still some, I would say, not uncertainty, but certainly. I think we have a lot of work ahead of us, and I wanted to make sure that we were able to take full advantage of the test schedule and the test program we've laid out for the next 2 years. That is why, in our budget, we deferred the purchase of the second aircraft.

Senator ROBERTS. Wow, let's not throw any red flags, I don't like referees anyway. I'm concerned with the MDA's decision to delay funding on the second aircraft. That's going to have the effect of moving the shoot down for the second aircraft and the program out to 2018. Now, if you go from 2008 to 2018, and then you look back at what your predictions are in regard to what our adversaries have, that's very disconcerting to me. If you have a 10-year delay from 2008, I don't know what we'd do with the highly-skilled engineers we have working on the first plane. There is going to be a

dip in regards to that kind of expertise, there's going to be—I think—some cost, certainly, associated with reconstituting this workforce once development of the second plane picks up after the shoot down in 2008, we have sort of a one-shot Suzy. That was a firecracker that I used to set off back in my days when I was from a small town in Kansas, I don't want a one-shot Suzy, I want a sure-shot, two-shot Suzy if, in fact, that is what we're talking about. I know that you must defend the President's budget request, but would you be pleased, sir, to have any additional funds in the fiscal year 2007 budget to pull the ABL second aircraft schedule back to the left?

General OBERING. Sir, I would.

Senator ROBERTS. Could you give the answer yes?

General OBERING. I would never turn down offers of additional funds. What we would do is try to buy back some of the risk that I think we still have laying ahead of us in the program, if that were the case. But I do share your concern with respect to the schedule. On the other hand, I want to make sure that we have allowed ourselves enough time to do a design turn on the aircraft. So a lot of those engineers you referred to will be fully employed, working on that design turn in that interim timeframe that we just discussed.

Senator ROBERTS. I thank you for your time, and I thank you for your support. Thank you, Mr. Chairman.

Senator SESSIONS. Thank you, Senator Roberts. Senator Reed, we appreciate you and your leadership, and your interest in these important issues.

Senator REED. Thank you very much, Mr. Chairman, thank you gentlemen, for your testimony.

Mr. Secretary, I want to see if I can put in context one of your comments in your prepared testimony where you say the prospect of long-range missiles in the hands of North Korea means that for the first time, the American people, too, would be in harm's way. Aren't we forgetting the Soviet Union and the People's Republic of China in terms of having ICBMs with nuclear capacities that put the country at risk?

Mr. FLORY. Mr. Chairman, I don't have in front of me the draft prepared testimony I submitted, if it was not clear than the point would be, for the first time in a situation involving North Korea that the American people would be at risk from attack by North Korea.

Senator REED. Okay, but essentially we've had several decades in which we've had to wrestle with the very existential threat from long-range missiles with nuclear warheads?

Mr. FLORY. That is correct.

Senator REED. Thank you. General Obering, the Mission Readiness Task Force (MRTF) proposed and accepted and scheduled a new test plan, and scheduled to get the GMD program back on track, and frankly for many who were looking at the program, it looked until this reevaluation as a rush to failure, rushing through the gate very quickly. The proposal that the MRTF recommended was to ground test and flight test over the course of 1 year. The first two tests were intended to have no targets, but to test the interceptor-related portions of the system, first on Kwajalein and

then from an operational site at Vandenberg Air Force Base. Only with the third test did the MRTF propose using a target, an outgoing intercept test instead of demonstrating the ability of the intercept to define and characterize the target, and only after all of these steps had been successfully accomplished did the MRTF propose to attempt to achieve an actual intercept in its tests.

Now MDA plans to build a target into the second test, contrary to the MRTF plan, and to program the interceptor to hit the target. Even though it is not being called an objective of that test, as such, MDA is planning to track or intercept three tests earlier than recommended by the MRTF. Why aren't you adhering to the MRTF plan that you and DOD originally agreed to, and again, in the context of I think a fundamental attempt to reshape the program because of this tendency to rush forward and fail?

General OBERING. Okay, well there's a lot there, Senator, let me back up if I could. First of all, we lay out and we execute our testing based on results, and so what the MRTF recommended is exactly what you describe, which we began to execute. We got to our FT-1, and we actually had so much success with that FT-1 with a kill vehicle flight, it actually achieved many of the objectives we had slated for the second flight test that the MRTF had recommended. Because of that tremendous performance in the kill vehicle, we also went back, we conferred and consulted with the MRTF and they agreed as well that it was prudent to add a target to the second flight test because of the success we had on the first one.

We are working very systematically through our ground tests, as you said, we've had successful static fires of the first stage, we've had additional qualification tests of the vehicle and so we're gaining more and more confidence as we go along. I feel comfortable that where we are right now in the test profile is about where we should be. We will accelerate and we will delay based upon the results as we go through. I wouldn't describe it as a rush to failure, what I would describe it as, as Secretary Flory pointed out, there is an urgency out there that we have to get a capability.

I believe that we are moving ahead prudently, based on test results that we have seen to date. We flew intercepts successfully in 2001, with a prototype of the kill vehicle, and we actually flew successful flights of the operational booster that we have on the ground today in 2003 and that gave us the confidence to begin this initial deployment.

Now one of the things the MRTF did cite is that we have become in some areas more schedule driven than we should be and that is why we took steps to adjust, that was not in any top-down direction, though, that was all in how we were actually implementing the program. I believe, as many would agree, that the most expeditious schedule would be one in which you have good quality control built in so that it's easier, and it's always faster to do it right the first time than to have to do it over and over again.

Senator REED. Thank you, General. One of the points you make is that you have to learn from each test, and for example, the FT-2 test would be the first launch from Vandenberg, and that's been skipped, essentially.

General OBERING. No, sir. We actually have launched the booster from Vandenberg before, now what we haven't done is launched an interceptor with a kill vehicle from Vandenberg, and this will be the first time that we do that, in the FT-2 that is coming up, and we will have a target from Alaska involved in this series. We still have a lot to learn, I'll grant that, in terms of overall, but we feel like we're at a pretty good level right now, in terms of our confidence and its performance.

Senator REED. One of the points that the MRTF made is that the flight test program can be broken down into specific pieces, and you can incorporate specific aspects to test out, but there's an overarching consideration that is getting to reliability and repeatability of these tests. So there's a logic to just having lots of tests, because if you can create an effect in one test, if you don't do it a second time then you might not be able to duplicate that, and that is one of the concerns I have is as you decide to just skip from these recommended tests, that you lose a little bit of that notion of repetitive reliability, and being able to do it again and again.

General OBERING. Yes, sir. Let me describe why we moved to Vandenberg to start with. We have flown the interceptor successfully out of Kwajalein, and as I said, that flight was so successful, we felt that we had achieved not only all of the technical objectives for that flight, but many of the original flight tests, too, as well.

Senator REED. Can I interject, because my time is almost up. Just for clarification, these were several tests that were different items, the previous tests had failed because I believe a fixture did not release the interceptor?

General OBERING. That was one of them, there was a software timing issue on the booster that was a fairly rare occurrence, and there was a support arm that failed to clear out of Kwajalein.

Senator REED. But in the test you're describing now, the support arm was illuminated, I believe.

General OBERING. In the FT-1, yes, sir, by design, because we're redesigning that ground support arm. The MRTF again recommended and we concurred, that it could be delayed because it is not considered a high-risk item.

Senator REED. Thank you, General, and I hope we have a second round, Mr. Chairman, because I have additional questions. Again, thank you for your responses.

Senator SESSIONS. Thank you, Senator Reed.

Secretary Flory, you talked about how the President directed the DOD to end what had been decades of research and development (R&D) to actually field an initial set of capabilities by the end of 2004. I remember we had a full discussion in the Senate in the late 1990s over that, and we passed the Cochran-Lieberman resolution to direct that we deploy as soon as practical, an MDS. Some observers directed that with nine GBIs now fielded, we should delay the deployment of additional GBIs until further operationally realistic testing has been completed. Based on your assessment of the threats, and we've heard others express comments about that today—would you share with us your concerns about delaying further deployment of GBI? I think this is a fundamental question and is a part of our whole funding process here. What is our eval-

uation of the threat, and what are our opportunities for deployment?

Mr. FLORY. Thank you, Mr. Chairman. I would say, with respect to stopping where we are, General Obering and Mr. Duma and General Dodgen have laid out in detail how the program is being managed, and the extensive testing and other measures that are being employed to ensure an increase in reliability of the system. I think we see a threat that is increasing, not decreasing. I think it's very unlikely that if we held off on deploying future interceptors that any of our adversaries would hold off on doing the things that are giving us concern, or as Senator Roberts said, keeping us awake at night.

I think one particularly important point and I can just add to what I responded to Senator Reed earlier, it is true that for decades there was no MDS over the United States, and that at that time the Soviet Union and later, the People's Republic of China, had missile systems that could threaten the United States. What we did not have was regimes like the North Korean regime or the Iranian regime and, particularly, the new president of Iran, Ahmadinejad, who would eventually have control over weapons of this type.

Senator SESSIONS. General Obering, briefly if we were to delay the production and deployment from the numbers we are now scheduled to carry out, that has a danger of increased cost from breaking the assembly line?

General OBERING. Yes, sir.

Senator SESSIONS. Are there costs out there for delays also?

General OBERING. Yes, sir, and those typically can run as many as the equivalent of four or five interceptors in terms of those delay costs. But your point is a very, very good one, and it is one that I think we need to reinforce more and more, and that is we're not dealing in what we can put out the door today. We're dealing with what we can get out the door in the future—in 2 years from now, in 3 years from now, and so the pace that we're on, the test program we're on, the aggressive testing we're doing, I think will continue to support that type of deployment and that type of fielding in order to make sure that we have done as much as we possibly can do with the knowledge points that we have, and the money that we have to get the maximum capability that we can, and I think that we're on about the optimum balance in doing that right now.

Senator SESSIONS. I think it is fair to say that we have a low production rate, we can't go much lower without shutting down the production system. Keeping at that system, in the long run, is going to provide us the missiles we need for our defense, and also keep costs per missile down.

General Dodgen, do you believe as the combatant commander representative here that the delay in fielding of the GBI until more operationally realistic testing has occurred is a good idea?

General DODGEN. Mr. Chairman, I do not think that's a good idea, I think where we are right now with the numbers of interceptors we have, our operationalizing of the system, our firing doctrine is more dictated by a limited inventory than it is by the effectiveness. We need two things to happen, and I think they're phased

pretty well, we need the end-to-end test which MDA is planning for later this year, to narrow our uncertainty in the system, and then we need the increased number of interceptors to come on board, so we can start developing our firing doctrine to take full effect of those interceptors and achieve the desired kill effect that we want, as opposed to being limited by our inventory. Those things, I think, are pretty well synched up, so any delay of one would cause us not to be where we want to be.

Senator SESSIONS. What are you hearing from the combatant commanders with regard to their concern about the threats they're facing, and the need for this system?

General DODGEN. Senator, they've all been here and spoken for themselves, but I would tell you that when I think of both North Korea and Iran, I think there is great concern that they will need defensive capability for their own theaters, and it will have a part to play in the defense of their homelands, and I think there's great concern on their part, and that's very much reflected by the fact that there's still a considerable Patriot force that is stationed overseas.

Senator SESSIONS. What about the status of Patriots and SM-3 production, are we keeping pace with the needs there? Does this budget keep us on track, or do we need to do more?

General DODGEN. We are comfortable, we have asked for 108 PAC-3 missiles, we're comfortable with that, because that is complimented by PAC-2 gems, so we have a mix of missiles that gives us a robust number on the terminal force, and we will begin to build up PAC-3s in the out years. In addition to that, the number of PAC-3s is somewhat in the future, will be turned into THAAD missiles, and there will be a mix of those missiles when they're available.

The SM-3 is just now starting to be operationalized, and we're doing a joint capability mixed study right now on future defense planning scenarios, both east and west to determine just how many sea-based missiles we have, it's a very exciting time, because the first time we'll be introducing a very capable maritime capability to the combatant commanders who are doing their operational concepts and concept of operations (CONOPs), so STRATCOM will do a joint capability mixed study, just to determine whether it's a mix of interceptors and systems we need for the future, and our thoughts are that will guide what we actually procure beyond where MDA is taking the numbers now.

Senator SESSIONS. Thanks, General Dodgen.

Senator Levin, I would recognize you.

Senator LEVIN. Thank you, Mr. Chairman. Let me pick up on a question which Senator Reed was asking you, General Obering. It has to do with this FT-2, which is planned for later in the year. First of all, I believe it is different from the recommendation of your own MRTF in that there is going to be a real target in the test. I believe you were asked why you were doing that, if not, would you explain why you are not following the recommendation of your task force relative to that test?

General OBERING. Sir, as I told Senator Reed, we've learned quite a bit from the ground testing as well as the FT-1 we conducted. We also wanted to get ourselves into a posture where we

could use an operational site, the operational configured interceptor, and operational radar at Beale. In the context, in the execution of the testing and because of the steps, all of the test results we've been able to analyze to date, it says that it is a prudent thing to do, and we have consulted with the task force in making those adjustments.

Senator LEVIN. Did they agree with you after your consultation? They now agree with you?

General OBERING. Yes, sir.

Senator LEVIN. Would they put that in writing? Would you get us their response on that?

General OBERING. Yes, sir.

[The information referred to follows:]

Based on assessments of the most recent Ground-based Midcourse Defense (GMD) flight test of the Ground-Based Interceptor (GBI) in December 2005, GBI ground tests, and the February 2006, flight test of a target across the Beale Upgraded Early Warning Radar (UEWR) test results, the Mission Readiness Task Force (MRTF) concurred with the recommendation to add a target missile to the upcoming GMD flight test provided that the appropriate Military Standard 1540 (MIL-STD-1540) qualification tests were successfully completed prior to the mission. MIL-STD-1540 establishes uniform definitions, environmental criteria, test requirements, and test methods for space vehicles, their subsystems, and components.

Key to this decision was that many of the original flight test objectives of the upcoming test were already accomplished during the highly successful December and February missions. The MRTF unanimously agreed that the next flight test involving a GBI demonstrate performance of the GBI's Exoatmospheric Kill Vehicle (EKV) during the last few seconds prior to intercept (which can only be achieved with a target). The MRTF members felt adding a target to the upcoming flight test would allow the GMD program to gain as much knowledge as possible prior to the first intercept attempt (scheduled to occur later this year depending upon the results of the upcoming GMD flight test and the continued GBI ground testing).

The members of the MRTF who participated in the decision to add a target to the upcoming GMD flight test of a GBI were as follows:

- Brigadier General Pat O'Reilly
- Mr. Don Mitchell
- Mr. Charles A. Ordahl
- Mr. John Silverstein

Senator LEVIN. As I understand it, you are going to try, then, to intercept the target, is that correct?

General OBERING. No, sir. It is if an intercept occurs it will be a by-product of it. That it is the first time we are flying the interceptor out of Vandenberg. We have flown a target across the Beale radar, we have not flown the kill vehicle, this version of the kill vehicle against the target as it relates to the radar track information we get from the Beale radar, so that will be the primary objective.

Senator LEVIN. I know that is your primary objective, but is it not an objective to intercept the target?

General OBERING. No, it is not at this time.

Senator LEVIN. You are putting the target out there without any objective to intercept it?

General OBERING. We're putting a target out there because we want to be able to do the tracking of the target across the radar, feeding that track data into the fire control system, getting the interceptor into place, comparing that with the target characterization that is seen by the interceptor, and so an intercept could occur, yes, sir, but that is not the primary objective.

Senator LEVIN. Is that a secondary objective?

General OBERING. Yes, sir, it would be.

Senator LEVIN. A secondary objective?

General OBERING. Yes, sir.

Senator LEVIN. That, to me, is an objective. It may be secondary, but it nonetheless is an objective. I think it's important that we note that.

Mr. Duma, sometimes the Director of Operational Test and Evaluation (OT&E) is directed by Congress to certify that a weapons system is operationally effective. Can you certify today that the system that we have deployed is operationally effective?

Mr. DUMA. No, Senator, today I cannot do that. However, three tests that are upcoming for the GBS. One, as you just discussed, with a zero-offset fly by as the scenario, will be followed by two flight tests with planned intercept scenarios. If these three tests are successful, then I believe that we will have at least demonstrated the capability for the limited defensive operations that was discussed previously. That gives me some confidence that we have some repeatability, because you have, essentially, three very similar scenarios of increasing complexity.

Senator LEVIN. If those tests are not successful?

Mr. DUMA. Then I would have to take a look at the test results. Failure would be an indicator that the system is not as mature as we think.

Senator LEVIN. That you are not yet operationally effective?

Mr. DUMA. That could be an indicator, yes, sir.

Senator LEVIN. Now is it possible that we are not going to ever be able to demonstrate operational effectiveness until have tests showing operational effectiveness?

Mr. DUMA. I'm sorry?

Senator LEVIN. Is it possible that we are not going to be able to demonstrate the operational effectiveness of this system? Isn't that always a possibility?

Mr. DUMA. You'll never have 100 percent assurance that the system will work.

Senator LEVIN. That is not my question. Is it possible you are never going to be able to certify operational effectiveness? Is it a possibility?

Mr. DUMA. I don't think so. I think the planned test program will build upon the test results and add that complexity so that you gain the confidence that we need to determine the system's operational effectiveness.

Senator LEVIN. It is not possible that we will never have that confidence?

Mr. DUMA. As long as the program continues to develop and mature, we don't have that zero chance that you're asking for.

Senator LEVIN. No, I'm asking whether there is a 100 percent chance that you are going to certify that this system is operationally effective at some point? You're saying, yes, it's 100 percent chance you're going to certify this?

Mr. DUMA. I'm saying with the current program, and the test events scheduled, it's very likely that the system will demonstrate ultimately that it is effective. If those test results are not favorable, or the program changes direction, becomes unfunded and it not be-

come a national priority anymore, than that's another ballgame that we're in.

Senator LEVIN. Then the outcome of that ballgame would be?

Mr. DUMA. Then we wouldn't have an MDS.

Senator LEVIN. We would not have an operationally effective MDS. It seems you're having trouble saying the words that it is possible that you may never be able to certify operational effectiveness, and it seems to me in your position, you always have to accept that as a possibility. It's not the goal; it may not be the likely outcome; but don't you have to, in your position, acknowledge at least the possibility that you're not going to be able to certify operational effectiveness of a system that has not gone through the test?

Mr. DUMA. Yes, I have reports I provide Congress, and if there are significant failures in those test reports when the system should be operationally effective, I can say in those reports that I don't believe it is operationally effective or suitable.

Senator LEVIN. My time is expired, thank you.

Senator SESSIONS. Senator Thune?

Senator THUNE. Thank you, Mr. Chairman, and I thank the panel for being here today, and for your service to our country.

General Obering, on page 3 of the MDA review, bullet five states, "Proliferation continues in quantity and quality." Can you comment on what trends MDA is identifying to support that statement, and what level of sophistication of technology materials are being proliferated?

General OBERING. I can comment on it in general, I can't get into specifics because of the classification of that. I can tell you that we see increasing numbers of missiles that are being fielded, we are seeing increasing numbers of missiles in development, in threat or potential countries, we see qualitative improvements in what we believe to be the performance of those weapons, and we see cooperation among many nations that we would consider to be threatening to the United States' interest. That is of enough concern, and the timing of those, that I do believe, as I mentioned earlier in my testimony, there is a sense of urgency of how we're developing and fielding this program.

Senator THUNE. I believe that obviously missile defense plays an important role in our national security, and the concern to me is the threat that the U.S. faces from cruise missiles and medium-range targets. I guess it's a broader question, is the U.S. prepared to identify and destroy cruise missiles or medium-range threats that can be transported and launched within close proximity to the United States?

General OBERING. Sir, I cannot comment on the cruise missile mission because that's not my area, but on the medium-range ballistic missiles (MRBM), that is a concern that we have. We believe that it is a very technically viable threat that we have to deal with. We are taking steps to provide us with sensor coverage to be able to meet that threat, and we are also fielding the interceptors that can handle that threat, and of course the positioning of those would be up to the warfighters and to the national leadership, but we certainly are building the tools to be able to address that.

Senator THUNE. I had the opportunity, General, not all that long ago, to go to Edwards and look at the ABL program, and obviously I think it's a platform that has great potential to deal with some of these threats we're talking about today. I know you covered some of this ground earlier with Senator Roberts, but if you could, I would be interested in knowing exactly what drove that decision and what impact that will have on the time line for fielding the system with a successful shoot down by 2008, and how does that effect the current cost projections on ABL?

General OBERING. Senator, first of all, the program has been making very good progress to the point where they achieved the knowledge points that we laid out for them in 2005. They have a very aggressive schedule over the next couple of years with the installation of the tracking laser, the airborne compensation laser and the high-energy modules themselves. We have a test program that gets the aircraft into ground testing this summer and flight testing with a surrogate of the high-energy laser this fall, then we will actually modify the aircraft with the high-energy laser modules in 2007 for a resumption of flight testing, to lead to a shoot down in 2008.

Now, having said all of that, I believe that we are going to learn more and more as we go along, as we have to date with the program. I think that there is a very high likelihood that while we will make steady progress, we're going to have to incorporate lessons learned. By the way, we're doing that right now, in the tearing down and re-assembling of the laser, we're going to have to make some adjustments based on the test program that we uncovered in 2005, and I wanted to make sure that we had allowed ourselves enough time to take advantage of all the lessons that we're going to learn between now and 2008, to be able to put that into a design package we can have available for the second aircraft, and that's why we thought it was prudent from that standpoint to delay the purchase order of that aircraft, in order to accommodate that design turn. What that means is that we will push out the availability of the second aircraft to about mid-decade, mid-next decade for test purposes, but we think it is a prudent thing to do in terms of being able to incorporate all the lessons learned we're going to be able to do over the next couple of years.

In terms of costing, I will tell you that the ABL program is not mature enough at this point to try to estimate or guesstimate what an aircraft cost would be because of the modifications and the lessons we learn in the next couple of years and how that may effect that, and Senator, very frankly, we may get to a point where it is very technologically achievable and it's very viable technically, but we may have trouble making it operational. So, we have to learn that as well, so that's another reason why we felt it would be prudent to take our time as we do this.

Senator THUNE. I appreciate that answer. It seems to me that it's a technology that holds great promise. I know that we're learning more all the time.

General OBERING. Yes, sir.

Senator THUNE. My hope would be we could keep as close to schedule as possible, so that incorporating that technology and making this system—by the time we can get it rolled out and oper-

ational—it can do the job that it was intended to do. Like I said, it just seems to me, at least, that this is something that in light of the threats we’ve talked about today, it has great potential as a part of our readiness in the future. I commend you for the work that has been done on it to date, and encourage you to keep pressing forward with that, and let us know what we can do to be helpful in that regard. So thank you, and I thank you, Mr. Chairman.

Senator SESSIONS. Thank you, we’re glad to have Senator Nelson, a ranking member of this committee here with us. He’s a great partner in these efforts, he understands them and cares about them.

Senator Nelson.

Senator BILL NELSON. Thank you, Mr. Chairman. If I may have my opening statement entered into the record, I have been on the floor handling an amendment.

Senator SESSIONS. We’d be delighted to make that part of the record.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

Thank you, Mr. Chairman. Let me join you in welcoming our witnesses today.

Last year, after two flight test failures, General Obering established an Independent Review Team and a Mission Readiness Task Force to help put the Ground-based Midcourse Defense (GMD) system and its testing program back on track. I want to commend you, General Obering, for taking that corrective step and for adopting their recommendations.

It was the right thing to do because it is important to make the system work effectively. The Mission Readiness Task Force concluded that it was more important to use four interceptors for ground testing—to get the technology right—than for operational deployment. I agree.

I think it is crucial that we adhere closely to their recommendations and plans, and not take shortcuts or diversions that could lead to a repeat of the problems that plagued the GMD system. As a recent Government Accountability Office (GAO) report points out, by accelerating the deployment schedule for GMD, the Missile Defense Agency (MDA) strayed from a knowledge-based and event driven acquisition program, and numerous problems resulted.

There are three major topics I want to focus on today. First is testing of the Ballistic Missile Defense System. Congress has passed legislation for the past several years to improve our missile defense testing, to help ensure that the system will work in an operationally effective manner. That is why Congress has been pressing for more operationally realistic testing, and for testing that will allow us to characterize the operational capability of the system.

Second, there are a number of issues relating to the GMD that need to be discussed. I would note that although the GMD element has not yet had a successful intercept test, and the Director of Operational Test and Evaluation says we don’t have enough test information to have confidence in its capability, this budget request seeks long lead funds for the last of the 50 ground-based interceptors, which the Department plans to deploy in Europe.

Third, we need to think about the issue of missile defense and space. Although funds are not requested in this year’s budget, next year, the MDA expects to request funds for a space “test bed.” This issue needs to be explored deliberately and fully in public debate. There are a number of concerns about the potentially negative consequences of deploying missile defense weapons in space, and we should not back into such a policy by default.

At the appropriate time, we will be able to determine if there is a need to go beyond our current terrestrial-based activities, whether it would improve our security, and whether going to space would be affordable. Knowing all the missile defense efforts we have under way now, and the threats we seek to counter, I remain deeply skeptical.

I look forward to hearing from our witnesses.

Senator BILL NELSON. Thank you, Mr. Chairman.

Mr. Duma, last year Congress passed legislation to enhance the testing and evaluation of the BMD System. It is public law, and it requires the operational test components to create a plan to test and evaluate the operational capability of each block sequence of the BMD System, and it says that each plan is subject to your review and approval. It also requires that the Director of Operational Test and Evaluation shall report to Congress at the conclusion of test and evaluation for each of that block period of time with an assessment of the adequacy of the testing and the characterization of the operational effectiveness, the suitability, and the survivability of the system, and so if you would share with the committee the status of the implementation of this provision of the law, including whether the test and evaluation plan for block 2006—which started in January of this year and goes to the end of 2007—whether the test and evaluation plan for that time period has been prepared and approved by you?

Mr. DUMA. The integrated master test plan has been updated—as a matter of fact, it was signed by all the parties concerned within the last 2 weeks. That test plan covers a period of 2 years, however we have been updating it on an annual basis. As General Obering stated, because the system is still in development, much of the test plan is based on the test results that we get, and so adjustments are made to the actual test events, and in some cases the objectives of those events, that test plan is signed.

Now, that covers the period for the block 2006. There is still some work to be done in determining exactly the capability to be delivered in block 2006, and a CONOPs to employ that capability. Those efforts are still ongoing, I expect those to be completed, that involves the Joint Operational Test Agency, the MDA, and my office.

The warfighters in STRATCOM are the ones working on the CONOPs. I expect at the end of the block 2006 phase, if you will, which will be December 2007, that we will have test results that I would be able to report in January of that year. That, I might point out that I also have two other reporting requirements for Congress, I submitted an unclassified report as part of my annual report which comes out about the same time, and I also have a reporting requirement that is due on February 15 of each year. So each year I have the ability to give you a status of the test program for the MDA in addition to the individual evaluations of a block.

Senator BILL NELSON. Where is your characterization of the operational effectiveness, suitability, and survivability of the system that's supposed to be reported to us in Congress?

Mr. DUMA. That is due after the block 2006, which would be January 2008.

Senator BILL NELSON. So you're not going to report that to us until that time?

Mr. DUMA. Not that particular one, but I will on an annual basis provide the unclassified report, part of my annual report and a classified report on February 15. I do that every year now, by a different law.

Senator BILL NELSON. You're talking about the law on the Integrated Missile Test Plan?

Mr. DUMA. No, that section 234 is for block 2006. The test report is due to Congress upon the completion of block 2006.

Senator BILL NELSON. Yes, and when is that test and evaluation plan for 2006 going to be done and reported to Congress?

Mr. DUMA. The test plan is prepared, that is what I just said, we signed within the last 2 weeks. The evaluation of the test results isn't due until January 2008.

Senator BILL NELSON. Mr. Duma, you're missing the requirement of last year's law. You're talking about a former requirement of Integrated Missile Test Plan, last year's law, Public Law 109-163, section 234, requires the operational test components to create a plan to test and evaluate the operational capability of the BMD System, and that should be reported to this Congress.

Mr. DUMA. That plan is in work, that is what I said in my earlier statement, it involves the CONOPs, and what is specifically to be delivered in block 2006, that is being worked now. The Integrated Master Test Plan is what was just recently signed and approved by my office, and the Operational Test Agency of General Obering.

Senator BILL NELSON. That was not my question, the Integrated Test Plan, the question was about the requirement of the law. So, you're saying you're preparing that plan now?

Mr. DUMA. That is correct.

Senator BILL NELSON. You're going to report that plan, not until January 2008?

Mr. DUMA. No, no, no, no. That plan is being worked, the results of the test events from that plan will be reported in January 2008.

Senator BILL NELSON. Okay, when are you going to report to this committee on when you've reviewed the plan, and assuming that you have approved it?

Mr. DUMA. That's in the works, I need a CONOPs from the warfighter, I need the capability to be delivered from the MDA. Those are two prerequisites to be able to complete that plan.

Senator BILL NELSON. Okay, needless to say, you see there is a good deal of skepticism that we come to the table, because we've had people sit in front of us before and express that they're going to give us information, and then we don't get that information. I can tell you, this Senator on this committee is going to require that, and I will look forward, as you have offered in good conscience here to bring forth that information when you have evaluated it and share it with this committee.

Mr. DUMA. Senator, I'll be glad to do that.

Senator BILL NELSON. All right.

In a recent report on BMD, Mr. Duma, the Government Accountability Office (GAO) writes that, "MDA cannot estimate the performance capability of block 2004 assets because it has not successfully completed an end-to-end test of the GMD element using production-representative hardware. Doubts about the rigor of the quality control procedures have also raised additional questions about the performance of the fielded GMD interceptors." Do you agree with that GAO report?

Mr. DUMA. I haven't seen that report, but I would say I do agree with that statement you just read. The quality control issues were raised at a hearing last year before this body, that is what caused General Obering to institute two independent reviews to look at

that. He has taken actions to correct those quality problems, whether those actions are effective or not, we won't know until we complete the flight test. We had one flight test that was done in December which met its objectives, we have three more remaining to be able to complete that flight test program. There was essentially a 1-year delay in the flight test program because of those two failed launches a little over a year ago.

Senator BILL NELSON. General Obering, according to the recent GAO report on the BMD, because of the quality control problems, it's possible that unreliable parts or parts that were inappropriate for space applications were installed in the first nine interceptors that were deployed in Alaska and California. GAO reports that, "An MDA audit found evidence that the reliability of the Exoatmospheric Kill Vehicle's (EKV) design could not be determined, and any estimates of its serviceable life are likely unsupported, and that contractor's production processes are immature and that the contractor cannot build a consistent and reliable product." I quote, and I'm quoting the GAO report. "This creates uncertainty about the performance of those interceptors, MDA has reportedly considered a number of options for dealing with this problem, including the possibility of using the missiles for reliability tests, or sending the interceptors back to the manufacturer for disassembly and re-manufacture." GAO reports that, "Program officials have recommended that MDA remove the interceptors when theirs is scheduled for upgrades and replace any parts found to be faulty." So, is it possible the parts now in the first nine interceptors could hinder or degrade the performance of the interceptors if they were used operationally?

General OBERING. Senator, let me address that. First of all, I have the utmost respect for the GAO, but I will tell you I was not very impressed with that work. I thought that they extracted information and came to some conclusions that were not necessarily contiguous in that regard.

Let me point specifically to the quality control issues. What we did was we went in and audited the contractor's facilities, as was indicated in the report. I have sent audit teams into the various plants facilities. We had one location that came back that was problematic and all the other ones across the BMD, seemed to be within reason of what you would expect. What we discovered in the one plant was that the EKV production facility was that we had a lot of what we call "scrap and rework." We would get parts and supplies in we would have to have reworked before they were acceptable.

A couple of things to remember about this, first of all, every interceptor that is sitting in that silo in Alaska and California has been acceptance tested, in other words they are acceptance tested, the parts, before they were installed and before they were deployed into those silos. They were acceptance tested, what we call the "maximum predicted environments," we did not do sufficient qualification testing for how much robustness in terms of added margin to those tests and that is what we've gone back through over the past year to go do.

Now, to answer your question directly, anything is possible. Just within the last 2 months, I had all of the experts sitting around

to include the quality control teams that did those audits and we walked through and said, "Is there any reason why we have discovered anything that would cause us to begin to pull the interceptors out of the silos?" The answer came back, "No, there is not." We have some things, some processes, as I said, some accountability in terms of both systems, engineering, and the parts control and configuration management that we have much improved at the contractor's facilities, and better government insight into that. I think we've taken some steps there.

Also, I will tell you that the FT-1, as I mentioned to Senator Reed, that kill vehicle and worked those up to war production representative, they were the configuration of exactly what we have in the audit today, and they performed exactly as we had hoped and had planned. I don't share the pessimism that came out of the conclusions that the GAO concluded from the same set of information that we had looked at within the agency.

Senator BILL NELSON. You don't think there was any poor quality control at the manufacturing?

General OBERING. So there's no doubt, there was. There was poor quality control. But what I'm telling you, is I believe we've taken the steps and I think the contractor has taken the steps to address those.

Senator BILL NELSON. Poor quality control of a critical component of the GMD system.

General OBERING. Yes, sir, which means we would have to go back and re-work that component to make sure that it met the acceptance test criteria before it was employed.

Senator BILL NELSON. But as you fix this problem in the future, are you going to test the nonmissiles to see if they have the right parts installed?

General OBERING. Sir, that is part of the comprehensive reviews we have already been doing, they have been part of this process, this review, comprehensive review all along.

Senator BILL NELSON. So the answer to that is yes?

General OBERING. Yes, sir, we know what the parts are that are on those vehicles.

Senator SESSIONS. Mr. Duma, you might just share with us what your operation test and evaluation division is, and you're statutorily created, is that right? What are your responsibilities with regards to testing?

Mr. DUMA. The office was statutorily created in the mid-1980s, I have three reporting requirements I have to oversee to ensure that operational testing is adequate, and that it's adequate to determine operational effectiveness and suitability. My office also received the live-fire test and evaluation office that was created separately by different law about 2 years later. That office was in a different part of the Department. In 1994, Congress passed a law that moved that office into the Operational Test and Evaluation Office. My responsibilities now are the adequacy of testing, operational effectiveness, operational suitability, and live-fire test and evaluation, which includes lethality and survivability.

Senator SESSIONS. If you feel like a testing program is inadequate, is that part of the regular reports you submit to Congress?

Mr. DUMA. It is.

Senator SESSIONS. General Obering, based upon your leadership on this system, do you doubt that we have a limited emergency capability at this point in time?

General OBERING. No, Senator, I don't doubt that, I believe that. Will it perform 100 percent precisely, as we had hoped? Not in all cases, but I believe that we do have sufficient confidence that the system will perform, yes, sir.

Senator SESSIONS. The testing and development plans that you have in place were designed to make it more robust and more capable as the months and years go by?

General OBERING. Yes, sir. In fact, if we're successful in the next two flight tests, we plan to make the next one even more aggressive than we currently have laid out.

Senator SESSIONS. Is there a CONOPs now in place for conducting limited defensive operations? I guess I would start with General Dodgen. What about that? What kind of concept do you have for conducting limited defensive operations?

General DODGEN. CONOPs for limited defensive operation is in place, and that's been agreed to. Operational orders have been developed, actually the JFCC is now working on the CONOPs and how to fight the global system. Meaning when we have the extra components that are coming in the radars to the east, we're not building a CONOP on how to fight that system on a global basis. So, I think on a standpoint of limited defensive operation, those things have been set.

But at this time, in answer to the question you asked me to address at the very beginning, which was an operational assessment of operational readiness, we've had the warfighters on the system for almost 2 years now, 24/7.

Senator SESSIONS. Let's be plain, the warfighters on the system, that means if we detect a threat, a missile threat?

General DODGEN. We have contingency capabilities.

Senator SESSIONS. You have a system in place today?

General DODGEN. That is correct.

Senator SESSIONS. Excuse me, go ahead.

General DODGEN. The warfighters have been on the system for some time. They've participated the viable piece of the way we work with the MDA that are operators, the soldiers and all the pieces of equipment are in every operational test, and every test that is done with the MDA, there is complete openness between the developmental operational activities and the operational activities. That creates a lot of confidence in the system, and the operators often identify some of the faults with the software that are regenerated in subsequent software builds. The soldiers are on the system, ready, and they understand the capability. A year ago, General Cartwright characterized the capability as a "thin line of defense." This is all about getting better and continually getting better, and so software improvements into the system which allow us to bring extra sensors into the system, more interceptors into the ground, more knowledge about the capability of the systems add more robustness to where we are. I think we're at the point right now where we're getting ready to be able to separate developmental activities from operational activities because we have separated our command and control notes, or are getting ready to sepa-

rate those things, that will allow us to add a great redundancy and robustness in very short order.

The thing that is lacking to reduce some of the uncertainty so that we can gain full advantage of all of the improvements we've made in the system over the next year is that end-to-end test when that's done that will modify our operational posture. But we have capabilities that we have identified through the Secretary of Defense and the President that have called upon, that this Nation can act within the indications and warning, to safeguard us, if necessary.

Senator SESSIONS. How long would it take to put the system on alert?

General DODGEN. Senator, in private session I would certainly tell you.

Senator SESSIONS. But you have those things in place? Have you determined what that is?

General DODGEN. Those things are managed on an hourly basis, how far away you are from capability.

Senator SESSIONS. I just want to drive home this issue and get straight to the American people, while this program is continuing to be developed and tested and verified, its capability is being determined, fully. It is now in place and operational and you, the combatant commander representative have the capacity to call on it if we're attacked by a missile, is that correct?

General DODGEN. That is correct, Senator.

Senator SESSIONS. General Obering, do you want to add anything to that?

General OBERING. No, sir, I think you said it very well, and General Dodgen answered it very directly.

Senator SESSIONS. Thank you.

Senator Reed.

Senator REED. Thank you very much, Mr. Chairman. I want to associate myself with Senator Nelson's comments about the importance of stepping up to the last year's legislative initiatives with respect to oversight and testing. I also want to commend Senator Nelson because he was the architect of that language, thank you, Senator.

Senator BILL NELSON. Gentlemen, if you understand some degree of skepticism, I want you to know General Obering, that your predecessor sat right there in front of this committee and told us at one point that we were going to have completely researched and developed and ready for operation an ABL, and, of course, that didn't turn out to be anywhere. He said within 10 months, and that didn't turn out to be anywhere close. So thank you, Senator Reed, I just want you to understand some of the degree of skepticism.

General OBERING. Can I comment to that, please, Senator? That is the reason in my opening statements I hit, and why we have incorporated so hard, knowledge points in our program, and that is what we will continue to focus on and to achieve.

Senator REED. Thank you, General. Mr. Duma, I want to get a sense of where the system is today, the ballistic missile system. This is an operationally deployed system that has not been operationally tested, is that an accurate assessment?

Mr. DUMA. All of the pieces are in place, they are in the field, yes, sir, and it has not completed any operational testing.

Senator REED. Is there any other situation where we have declared a system to be operationally deployed, but we have no operational testing of the system?

Mr. DUMA. There are systems that have been deployed to tactical theaters like Iraq and Afghanistan that have been developed and fielded directly without operational testing. Those have not been what we would call Major Defense Acquisition Programs (MDAP).

Senator REED. Right, those were systems, in fact, I think we've deployed a lot of systems where, we tried to just drop counter IED and others that are just off the shelf, get it out there, try it—but I think that is what causes some question, criticism, and comment when it comes to this system. The mere fact that a major defense system was declared operationally deployed, but we haven't conducted one operational test. That seems to defy logic of perhaps not the experts, but certainly most people. There's also another clarification, the system is not on alert today, is that correct General Dodgen? It is not on alert?

General DODGEN. It is not on alert.

Senator REED. So in your response to Senator Sessions, you would have to give warnings and indications, and then you would have to declare the system on alert to actually be in a posture to try to intercept a missile, is that correct?

General DODGEN. I think when I say it's not on alert, what I say is that we haven't been ordered to alert by command authorities. I think we're watching indications and warning on a minute-by-minute basis on our operational view so we're getting a clear view and the combatant commanders can then request that it go on alert, or move to a more operationally-ready posture.

Senator REED. Thank you, sir. Now let me get back to Mr. Duma. I think this was part of the discussion you were having with Senator Nelson. Even though you are the objective evaluator of the operational capacity of the system, the strap-down commander could declare this even more operational independent of your judgment. He could say, "Well, we're going to alert, and we're declaring another step." Is that true in terms of the breakdown of responsibilities?

Mr. DUMA. That is true. My role in this particular program is very unique. The statutes that Senator Sessions talked about that created my office require operational testings be completed on a system before it goes into full-rate production. Also, the Services are required to use low-rate initial production items that are production representative in operational testing. Those rules were suspended, or waived, for the missile defense program several years ago. In fact, the role of my office really is one of an advisory nature for the test program. Clearly they're in developmental testing, we're trying to make it as operationally realistic as possible.

When the missiles failed to launch a little over a year ago, General Obering chartered the independent review teams and the Mission Readiness Task Force efforts. One of the realizations by the leadership in the MDA was just how early in development it really was. I credit them with taking a very prudent approach for correc-

tive action on that, and that is what delayed the Flight Test Program by a year, in essence.

But, having said all of that, there was a significant amount of ground testing that was done during that year. The most significant portion of that was involving the warfighters. That was one of the things that I felt needed to be done that was done during this last year. As I said in my opening statement, the warfighter understanding of the capabilities, the limitations, and the actual maturity of the system was enhanced through that ground testing. What we lack is that final end-to-end operational test through intercept. That just hasn't happened yet.

Senator REED. Let me ask you another question, Mr. Duma. That final operational test, would essentially be a salvo of at least two interceptors per target, handling a multiple engagement, maybe several warheads coming in. Is that a fair description of a baseline operational test?

Mr. DUMA. As the system matures, that certainly would be something in the realm of possibility, but what we're looking at to declare the limited defensive operations is something less than that, it is a single incoming missile with a simple missile, if you will. Okay, that is what the next three tests, that is the scenario that you're looking at, but the system is going to mature. For instance, there are already discussions going on that if those tests are successful, maybe even that third test in that series, we ought to be adding counter measures to it already, those discussions are ongoing General Obering and I have had those discussions, they are active in the test community with the MDA, and so to get to more advanced countermeasures, multiple launches, that's part of that maturation process and that is beyond the limited defensive operations that the next series of tests is designed to look at.

General DODGEN. Senator Reed, could I draw an analogy to the PAC-3 system, if I may? When the PAC-3, we're going to constantly test our system, it could be driven by future threats we want to be addressed and what to go against. When Operation Iraqi Freedom hit, the PAC-3 system had not been certified for release by the operational tester, it had done some operational testing. The warfighter, Commander of CENTCOM commanded those missiles go forward to Kuwait and a conditional release was granted because they had not been certified. They went immediately into theater the next day, and were very successful, particularly in protecting the land component commanders in Kuwait. Now, I think that's an example where there actually had been some operational testing, but it had not been certified by the tester to go forward, but the combatant commander said, "There's military utility here, and we need to deploy this."

Senator REED. Expediency will always require us to do what we have to do, but I would be much more comfortable in a situation where we have some operational testing, at least, before we declared the system operational, and also I think PAC-3 is an example where Mr. Duma's agency was involved as a major defense acquisition, step-by-step with a robust valor. I think, and I must say, one of the reasons this program has suffered is because we have decided to do something unusual and take out the desk agencies

from the contractor supervision. My time has expired, I want to thank the chairman for his patience.

Senator SESSIONS. Senator Levin.

Senator LEVIN. Thank you, Mr. Chairman.

Mr. Duma, this system has not had any operational testing and an operationally configured system has never had a successful intercept test. We have had a number of test-like failures. I understand that you have reported, and tell me if I'm accurate in this, that there is "insufficient evidence to support a confident assessment of the systems capabilities." Is that inaccurate?

Mr. DUMA. Yes, Senator, that is accurate. The February report that my office submitted a year ago evaluated the engagement sequence groups, there were point estimates and had confidence intervals on them. These estimates are in the report that I submitted to Congress. In my report this year, I indicated that I couldn't change my assessment from what I reported a year ago, because I had no additional flight testing with which to change either those point estimates or those confidence intervals on the performance.

Senator LEVIN. So, OT&E says insufficient evidence to support a confident assessment. That is still their position? Secretary Flory, you, in front of the House, said last month that we are confident that it could intercept a long-range ballistic missile. Now your OT&E Acting Director says there is insufficient evidence to support a confident assessment, but you told the House that you are confident. How do you square those two statements?

Mr. FLORY. Senator Levin, I looked at this question yesterday in preparing for this hearing, and I recall the discussion that took place at the last hearing, and particularly the testimony that was given after I testified in the last hearing where the word "confidential" was used by Mr. Duma, General Obering, and it became apparent that I'd used a word that was a term of art in the technical and testing community. So I decided in my testimony today not to use that phrase again, because I realized I had given the impression that I was, in effect, making a technical judgment, and what I said today was, based upon that reflection, that the elements were in place to intercept the missile.

Senator LEVIN. The elements are in place where intercept is possible?

Mr. FLORY. Where intercept is possible. I don't have my exact statement in front of me.

Senator LEVIN. But in terms of your confidence level, you are not saying you are confident that it will happen?

Mr. FLORY. I'm not making a tester's or operational judgment on confidence. I believe the elements are in place, I think it can be done, but I'm not making that kind of formal assessment.

Senator LEVIN. First of all, I'm glad to hear that. I think there has been too much hype, too much exaggeration about the system and what it will do. It is a system which has not yet been operationally tested. Hopefully it will be able to have a capability. But in terms of confidence level that it will do so, that level of confidence has not been expressed yet by your technical people. I think it is important that you make that modification which you just described.

In terms of the production of the missiles, the interceptors, what is the inventory objective? Objective, I think is the right word, I'm not sure which of our two Generals I should look to with that question.

General OBERING. Sir, I can tell you what we have programmed, we have a total of 50 interceptors programmed in inventory, 10 of which we would deploy to a third site.

Senator LEVIN. Then it is your current plan to then terminate production at that point?

General OBERING. We would level off, we would not terminate production, we would have to continue to produce, because we're going to take those missiles and we're going to fire them out of the silos and test and replace them in their silos, so we would continue a production program to be able to do that.

Senator LEVIN. So except for some test interceptors to fill the place of the ones that had been used, production would end in terms of regularly deployed interceptors?

General OBERING. Yes, sir, but we would keep the line such that if we needed to ramp up for threat reasons or for contingencies we could do so.

Senator LEVIN. How many interceptors a year would you need to keep the line open? Keep it warm?

General OBERING. We're producing at about the rate of one every 2 months or one every month and a half, something like that, and that would be a warm level that we could continue to sustain.

Senator LEVIN. You mean the current level?

General OBERING. Yes, sir.

Senator LEVIN. So you would maintain the current level to keep the base warm?

General OBERING. That depends upon how many tests we want to continue to do, how many modifications we want to include. There are several things we are going to plan for this, we're going to upgrade the kill vehicle on these interceptors so we will have a multiple kill vehicle capability that would go on to the boosters that we have in the silos today and so I'm sure there's going to be a test program that will accommodate that. We'll double ramp-up our testing.

Senator LEVIN. Do you know what the minimum number of missiles is that is required to keep the base warm?

General OBERING. We're about there, we're about there right now, sir.

Senator LEVIN. So, you have to produce a missile and a half a month in order to keep your base warm?

General OBERING. Not a missile and a half a month, it would be about a missile every 2 months.

Senator LEVIN. I'm sorry, a missile every 2 months in order to keep your production base warm. Which means forever, because if you always want to be ready then you are going to have to continue to have to produce one every other month.

General OBERING. As long as we want to continue that testing profile and continue that contingency profile, yes, sir.

Senator LEVIN. What do they cost, these missiles?

General OBERING. They are roughly about \$40 million an interceptor.

Senator LEVIN. Okay, my time is up, thank you. Thank you, Mr. Chairman.

Senator SESSIONS. I would like to see if we can clarify what we mean by not having an operational testing of this system. That does not mean that component parts of it haven't been tested, but that the system is now deployed in Alaska with the advanced radar warning system and that the entire system has not been tested as of yet, is that correct?

General OBERING. Senator, if I could answer that, and maybe Mr. Duma would like to chime in. Here's what we've done: We have successfully intercepted four or five times with the prototype of the kill vehicle we have in the ground, the basic functionality, the basic technology. We believe we've proven the processing power, we have the margin on the divert system, we have demonstrated the algorithms, we've demonstrated that when we put this kill vehicle in its terminal game it does a pretty good job.

Senator SESSIONS. Now those were tests that occurred in October 2002?

General OBERING. 2001, 2002, in that timeframe, yes, sir.

Senator SESSIONS. You actually did a hit-to-kill an incoming missile? Missile-to-missile?

General OBERING. Yes, we did.

Senator SESSIONS. It impacted and destroyed?

General OBERING. Yes, sir, we did.

Senator SESSIONS. That's exactly the same system we now have deployed to Alaska?

General OBERING. No, sir, we actually improved and upgraded the kill vehicle to make it more robust, to make it more producible, to make it easier to produce, obviously. We flight tested the booster that is in the ground, we did that successfully in 2003. We put it together, the kill vehicle and the booster for a flight test last December. So, we have done the fly-out of the interceptor from the silo, into the terminal game and that was a successful flight test in December, as I mentioned earlier, so successful we decided to accelerate our test program.

But we had two other very important tests this past year we haven't really emphasized enough. One, we air-launched a target out of the back of a C-17 over the face of the Cobra Dane radar. There were many that were skeptical that we could use this radar in our MDS. This was an operationally realistic test in terms of the threat representation of the target in actuality, it was even more challenging than we would have outlined, probably, in an operationally realistic test, because of what the threat target represented to the radar. The radar performed, the operational fire control system performed, that is the hardware and the software that makes up the fire control system, and we generate a weapons test plan to intercept solutions on this track.

Another major test we did against the Beale radar where we flew a target out of Alaska, across the face of that radar, just this year, in 2006—in fact, we were more than surprised in the sense of how much more accurate that radar was than we had anticipated in real-life testing. So, while we have not put it all together as we have said, end-to-end, we have taken the major functional steps of

all of these components, and exercised or tested them at any one time.

One thing that Mr. Duma pointed out also, I think very accurately, is a key element of this is the operative sitting of the council, how comfortable they feel with the system and its ability and its performance. We have done testing and transitioning of the system many, many times with the warfighter, exercised those in war games as well as exercises and ground tests and that is one reason they also feel comfortable. So, while we have not done all of the end-to-end testing we need to do with the operationally realistic testing we plan to do this year, we've certainly done as much testing as I believe that we needed to do to give us confidence to proceed. We have deployed weapons into combat before without even some of the level of testing we're talking about, in recent conflicts.

Senator SESSIONS. If an incoming missile is coming, I'm glad you're there and we have a realistic possibility of seeing that missile knocked down rather than successfully hitting the United States.

General Dodgen, the operational command forces are working with General Dodgen's team now at the T sites?

General DODGEN. Absolutely, Senator.

Senator SESSIONS. The goal would be eventually that General Dodgen's people would depart, and it would be operational completely, is that correct? I mean, that's the general concept?

General DODGEN. I think given the nature of this system, I think there will always be a partnership between the MDA and the soldiers that man the system, and that partnership mandates that complete openness going back and forth, and I would just echo what General Obering said that we have transitioned this system to a ready state many times. We know how to do this as a team, so we're confident in those procedures, we have done the tests together and I think there is a shared confidence in the system.

Senator SESSIONS. Senator Nelson.

Senator BILL NELSON. Mr. Chairman, you said that you were glad that they are there, and my response would be I hope they're there, but what I've always been taught is that you go through research and development first, before and then do your testing before something is declared operational. I hope they're there. General Dodgen, a few minutes ago in response to a question, gave another example of taking the PAC-3 and deploying it while it was still being tested. General Dodgen, that was the third generation of the Patriot missile, was it not?

General DODGEN. It had been through some operational testing and it was fairly mature. But my point was that it had not been certified for release by the testing community.

Senator BILL NELSON. But a lot different from developing a BMD System from scratch?

General DODGEN. Senator Nelson, I will tell you that the end-to-end test for later this year is important to understanding our capabilities and to further our capabilities and increase our capabilities, and the warfighter is very much focused on being a part of that and understanding our capabilities after that.

Senator BILL NELSON. Look, all of us want to get in the same place at the end of the day and that's to have a successful system.

We're here to try to help you try to get there, but I want to see us come along and get to it without a bunch of obfuscation and false promises, which is what we seem to have had in the past several years.

General Obering, before we can build a deployment site in a European nation, we have to first select a host nation, reach a formal agreement with that host nation, work out the details of the deployment—I understand that we have not reached such an agreement yet, since we have not chosen a host nation for a third deployment site. The GAO notes that although MDA planned to install a web browser in the United Kingdom in 2005 to provide them with situational awareness, the installation was delayed because DOD did not complete final policy agreements as scheduled. Similarly, there has been a delay in the deployment to Japan of the Forward-Based X-Band Portable Radar because of delayed negotiations with Japan on the location of the radar. Now, these are less complex matters than the building of an MDS, and the deployment of a base like Fort Greely. Tell me, is it possible that we will not reach agreement with a European nation this year on deploying the GBIs on their soil?

General OBERING. Senator, I will answer part of that, and then maybe Secretary Flory can answer part of that as well, and what I would like to do is focus on the technical aspect of your question. By the way, you brought up a very good point on the deployment of the Japanese radar, it's one thing that the GAO report totally failed to address. They ignored almost a billion dollar program in our scope of work on our sensors in these forward-deployed radars, and in fact we accelerated the deployment of the Forward-Based X-Band Radar that originally was based on our initial conjecture was going to be in block 6. We actually accelerated the delivery of that into the block 4 timeframe. I believe that our allies, Japan, have really done a great job in working with us and it shows what teamwork and partnership can do to accelerate a program like that because of what we both perceive the urgency to be.

Now, having said that, to be very honest, nobody has accused MDA of not being able to spend money, and we have a program of work loaded in the 2007 budget request that would go to the third site you just talked about. I believe that we can certainly—given the go-ahead—expend the money that we have planned for 2007 to do the site planning, the soil sampling, the facility design and layout, the legacy we have here, as you have said, is we've done this at Fort Greely, we've done this at Vandenberg, so this is not starting from scratch, we're hitting the ground running, here. So we have a lot of experience under our belt in this regard. We do have several nations that have expressed a strong desire to work with us on this, and I will let Secretary Flory answer the likelihood of whether we would have a decision this year.

Mr. FLORY. Thank you, General. Senator Nelson, I don't know, I'm not going to give you a likelihood in terms of a percentage, I would say that it's conceivable we might not have agreement, but it's not what I expect to happen. We have consulted with a number of countries since 2002, we are continuing to consult, and we're certainly working hard to have a decision this year.

Senator BILL NELSON. Mr. Secretary, don't we have a problem that we need a third site system to be effective in defending Europe against an Iranian medium-range or intermediate-range missile?

Mr. FLORY. Senator, I'll defer to General Obering on the specific technical capabilities. The primary, the goals of deploying a system would be both to improve the defense of the United States, and to extend the missile defense protection to the countries of Europe. General Obering, if you want to get to the specific capabilities.

General OBERING. Yes, sir, we do need a third site to be able to protect our deployed forces in the region, our allies and our friends from an ICBM class target or a high intermediate-range missile class target, yes, sir, we do.

Senator BILL NELSON. I think it's interesting to note that the Director of the DIA did not even mention anything about working on ICBMs. He said at a worldwide threat hearing in February that Iran's efforts were on a regional ballistic missile that could reach Tel Aviv. If Iran wanted to strike targets in Europe with ballistic missiles, it appears much more likely that they would develop a regional missile before they would develop an ICBM.

Mr. FLORY. Senator, if I could just say a word on the threat. The IC has assessed that Iran could develop and could flight test an ICBM in 2015. I mentioned earlier there's a new national intelligence testimony that gets into a lot more of the details of this in a way we can't discuss here, but we do have serious concerns, and I think it was the DNI who testified before this committee, I'd have to double-check that, about the serious concern posed by Iran's pursuit both of nuclear capability and long-range ballistic missiles.

Senator SESSIONS. I think you've given us the rationale of the deployment of a European-based missile. I would just say that Iran or any other hostile nation in that area needs to know that the United States and its allies are not going to remain vulnerable to attack, from that kind of missile attack that can include a WMD as a part of it, and that we have that capability. I think we will have support in Europe to do that and I think as a matter of policy we have to continue to proceed with that concept. Secretary Flory, I guess, would you have any comments about that?

Mr. FLORY. Mr. Chairman, I agree fully with what you said, and I would make the point that we have concerns about Iran's missile capabilities on several levels: its regional capabilities, its capabilities that could allow it to threaten Europe, its capabilities that could allow it to threaten the United States. It's important to recognize the capability, assuming Iran continues to move in the direction it's going of developing greater and greater capabilities.

Iran's ability to threaten Europe would also be a threat both to European populations and European countries, it would also be a threat to the United States and our ability to conduct a robust foreign policy in defense of our interests. For example, if the Iranian government were able to hold Europe at risk, it wouldn't be necessary to hold the U.S. itself at risk, in order to have a significant deterrent effect on the United States in trying to blackmail the United States from not carrying out any particular action or set of actions that we might feel we needed to carry out in order to defend out interests in the Middle East. So, the gradual extension of the Iranian missile shadow, eventually the Iranian nuclear shadow,

is something that every time it moves outward, it further threatens our friends and allies. Also, it further constraints our ability.

Senator SESSIONS. Thank you, you said that very well, and that is the way I see it, and we don't need our friends and allies held hostage to the legitimate national security of the United States. Senator Nelson, do you have some more? Then we'll wrap up.

Senator BILL NELSON. Yes, sir. General Dodgen, could you tell us the remaining issues that need to be resolved before the system would be placed on alert?

General DODGEN. I would say that as a minimum the software build we are currently in which would allow us to expand the system and create a redundancy needs to be completed and that will be done very quickly. There are other considerations, whether or not a complete end-to-end test needs to be done before we put in on full-time alert is a different matter but what I am telling you is the command and control issues, the ability to go to that full-time alert posture will be set very quickly and then I think that's the minimum that is probably necessary. But the system will always get better, Senator, and I appreciate your interest in pushing us down that road.

Senator BILL NELSON. What about the sensor integration issues?

General DODGEN. I think that is tied to the software pieces, I think when you have the software ready, then you can bring the forward-deployed sensors in and get those tested and when those things are done, I include that as a part of that command and control software build, when that is done, I consider that the minimum to move forward.

Senator BILL NELSON. So your conclusion is that you get the software development like you want it and then General Cartwright is going to be ready to recommend that the system be placed on alert?

General DODGEN. I can't speak for General Cartwright, but I would say that. In my opinion, those things of getting those extra sensors in and creating that look east and west, and having that redundancy in our command and control system so we can continue concurrent development and operations is vital to us going to full-time defensive operations. The qualitative piece will always be debated, Senator.

Senator BILL NELSON. We will follow that up with General Cartwright all right.

General Obering, I want to talk to you about space-based interceptors. In your March 20 presentation to a conference, you asked, "Do we need to go to space with interceptors?" Then you also asked if a space layer would significantly enhance system performance and responsiveness. Will terrestrial-base BMD assets be sufficient to deal with increasingly sophisticated and shifting threats? I think these are legitimate questions, this is a significant issue. Now, the question is, can we afford it? We already have a great deal of missile defense activity taking place to handle the threats, we're concerned about the possibility of North Korea and Iran developing, as we discussed here, long-range ballistic missiles and deploying a limited number of the missiles. If long-range ballistic missile threat remains limited, and if we're not trying to build a capability to defeat the ballistic missiles of Russia and China, do you think that

the terrestrial-based system should be adequate to accomplish the mission? Instead of a space-based?

General OBERING. Sir, that's a good question. The reason why we would add a space-based layer, first of all, we think it is very important that we have the sensing layer in space. Because we believe it is the most cost-effective way to go where you can get precision-tracking sensors in space to allow you the flexibility to cover the globe, so to speak, with respect to any emerging threat in the future.

The next question becomes, if you think you can predict with certainty what threats we're going to face over the next 20 or 30 years, then we can certainly keep populating the world with terrestrial-based and fixed-site interceptors and sensors. If we believe that we're not going to be able to do that very accurately, then we believe that a very modest space-based layer may be the way to go there. But there are some questions to ask and there are some questions to answer about the technical viability of that, and that is why we believe that before we take that step we ought to do some experimentation to understand what it is capable and what it is not capable of in that regard.

Senator BILL NELSON. Is it U.S. policy to have a system to defeat the long-range missiles of Russia and China?

General OBERING. Sir, the system we have fielded today does not address a threat from Russia nor Chinese missiles, it does not do that. We believe in our development program it's always prudent because you make sure that you can at least understand where these various countries are headed from a technical perspective, and we try to make sure that we do that in a development program, but we're not fielding a system today to address those countries.

Senator BILL NELSON. So the present system is not part of a U.S. policy that would defeat the long-range missiles of Russia and China?

General OBERING. No, sir.

Senator BILL NELSON. General, in your prepared statement, you discuss examining tradeoffs to determine what to fund, and that is what we're basically trying to get to here. What's Congress going to decide with regard to the funding of all of this? One of the areas to examine is the diversity of basing modes, including space. Does your statement imply that you're already planning on using those layers in space as a basing mode for the missile defense?

General OBERING. No, sir. It does imply that from a sensor's perspective as well as from whether you're talking about sea or land-based as well, but we do not have a space-based interceptor program laid into our program today.

Senator BILL NELSON. Can you assure this subcommittee that you do not have any plans to place a BMD in space?

General OBERING. As we're sitting here today, Senator, I do not. Now, that does not mean that we may not come back to you tomorrow, based upon where we would like to take this capability, but as we're sitting here today, no, we do not.

Senator BILL NELSON. Do you have any plans to put a kill vehicle in a N-Fire satellite?

General OBERING. I wish we could have, sir, but we're not going to be able to. The kill vehicle we were going to put on that experimental platform was not mature enough and was not ready, so we replaced it with a communications terminal.

Senator BILL NELSON. Last year, I asked the Under Secretary for Acquisition to explain the unbudgeted out-year funding wedge that appeared in fiscal year 2006. His answer was basically that the projected funds would be paid by the Services for deployment of certain systems. This year we see the deployment funding wedge again, starting in 2008 with a notation that it suggest it will be for deployment. Can you explain what the funding line is supposed to represent? Whether it's actually budgeted or programmed?

General OBERING. Yes, sir. What that's supposed to represent is a departmental commitment that anywhere from \$1.5 to \$2 billion in that vicinity will be allocated for deployment and for fielding and sustainment of the system and that is about what we've been targeting and what we've been tracking, too, but the Department also likes to make us work for our money, so that is why you see that notation like that, is because we have to achieve our knowledge points and achieve the progress we need to before they allocate that to our budget.

Senator BILL NELSON. You are a key person in this whole thing, and you posed the question at the March conference that you spoke to, saying how much defense is enough? So, what is your sense of how much is enough?

General OBERING. Senator, for what we are facing today, and from where I sit today, the perspective lies, I think that the allocation by the Department, by the President, the missile defense is about right. I think it will allow us to keep pace with the rogue nation threats we've talked about, that we see developing on our TVs every day. I believe that we have it about right with respect to the balance between fielding, sustainment, and development of future capabilities for the system, but we will have to continually evaluate that as we go along, but from where I sit today I am pretty comfortable with where that investment is, which is not a very large percentage of our overall defense budget.

Senator BILL NELSON. This committee wants to see that successful test.

General OBERING. Yes, sir, so do I.

Senator SESSIONS. Thank you, Senator Nelson.

Mr. FLORY. Just to make it clear, I do too.

Senator SESSIONS. Mr. Duma, you're an objective evaluator.

Mr. DUMA. I'll take the results of the test and report it.

Senator SESSIONS. This has been a very good hearing. I think we've had a very interesting interchange about a part of our defense posture that is very important. We thank you, each of you, for the time and commitment you have given to it. It's important, I believe, to our national defense, and I believe we're on track. I believe the fundamentals of this program have been clearly proven and that the technology is there, it's just going to be a challenge of bringing it all together in this system and proving the system is workable, and continuing to enhance that capability as the threats continue to increase. So, we thank you for that, we will keep the hearing open for written questions for 48 hours.

Senator SESSIONS. I would note, General Obering and General Dodgen, that I will be submitting some questions concerning BRAC and how we're moving along with that, we've talked about that previously. Personally, I appreciate your forthcoming attitude about that. We would like to see BRAC, once we've made these commitments, stay on track to full completion.

Thank you, if there's nothing else, we will adjourn.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

TRANSITION ISSUES

1. Senator SESSIONS. General Dodgen and General Obering, a September 2005 Government Accountability Office report notes that "there is uncertainty as to which assets may eventually be transferred to each military Service and under what conditions those transfers should occur. This uncertainty makes it difficult for the Services to plan to address the requirements of Department of Defense (DOD) acquisition regulations and realign their budgets to support the missile defense mission."

This uncertainty has implications for the fielding of missile defense capabilities to the warfighter. For example, the Missile Defense Agency (MDA) plans to build only 48 Theater High-Altitude Area Defense (THAAD) missiles, with the assumption that the Army will procure further missiles. Yet the Army has no funding for THAAD in its Future Years Defense Plan (FYDP). Likewise, the MDA has reduced its deliveries of the sea-based interceptor (SM-3) from 100 to approximately 80 over the FYDP, yet there is no sign that the Navy plans to procure additional SM-3 missiles.

If the Services don't start to budget for missile defense, the MDA will have its research and development budget increasingly whittled down as deliveries of missile defense capabilities capture a larger share of the missile defense budget. Who in the DOD can assure us that the Services will start to budget for the procurement and operations of missile defense capabilities?

General DODGEN. The Department continues to work through the decisions to ensure an effective layered missile defense system is fielded to protect our Nation and deployed forces. Many critical decisions have already been decided and major accomplishments have been realized. For instance, funding for manning and maintenance of the Ground-Based Midcourse Defense System at Fort Greely as well as the initial fire units of the Terminal High Altitude Air Defense Operational System are part of the Army's FYDP. Total funding requirements for these programs will continue to be a shared MDA and Army responsibility.

Using its Unified Command Plan authority to advocate for warfighters' missile defense capability, United States Strategic Command (STRATCOM) has initiated the Joint Capability Mix (JCM) study to determine the optimal mix of sensor and weapon assets to achieve desired operational effects necessary for an effective global missile defense. The JCM study, which will be updated annually to identify necessary capability mixes need by the warfighters, is supported by the Geographical Combatant Commands (GCC), Joint Staff, and the Services.

A major goal of the initial JCM is to address the most pressing funding issues in the 08–13 FYDP. While this year's JCM is still being worked, the emerging results indicate the significant value of the upper-tier systems (SM-3 and THAAD) in all GCCs' areas of responsibility. While the exact details of transition may not be finalized in this budget cycle, JCM results will be used to ensure we have continuity in these programs as we build a robust capability.

General OBERING. I can assure you that the Department, MDA, and the Services are analyzing what capabilities to buy, when to transition them, and when to program the resources necessary to do so. General Dodgen initiated a capability mix study last year to determine the right combinations of missile defense capabilities we should buy. The Joint Functional Component Command-Integrated Missile Defense is conducting the study and we expect their results later this year. The study analyzes both the threat and the appropriate combinations of interceptors and sensors necessary to counter that threat in 2012, 2015, and 2020. The study will also identify key decision points to influence budgeting for the fiscal years 2008–2013 FYDP and the fiscal years 2010–2015 FYDP.

Since January 2005, we have aggressively engaged our Ballistic Missile Defense System (BMDS) stakeholders—the Services, the combatant commands, and Office of the Secretary of Defense (OSD) staff, regarding when to transition and when to pro-

gram the resources. We have developed our first transition plan that addresses the sufficient lead time necessary for the Services to procure, operate, and sustain the BMDS. In April 2006, the Under Secretary of Defense for Acquisition, Technology, and Logistics requested the Services concur with the plan and identify issues needing further resolution.

KINETIC ENERGY INTERCEPTOR

2. Senator SESSIONS. General Obering, your testimony notes that MDA is requesting \$984 million in fiscal year 2007 to preserve decision flexibility with respect to the two boost phase programs, Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI). If both ABL and KEI achieve their key knowledge points, how do you decide which system to buy?

General OBERING. If both ABL and KEI succeed in achieving their key knowledge points, and if they both prove to be cost effective, ABL will become the boost phase element of the BMDS and land-based KEI with Multiple Kill Vehicle (MKV) will become the mobile upgrade to the midcourse element.

3. Senator SESSIONS. General Obering, would you consider going forward with both?

General OBERING. If both ABL and KEI succeed in achieving their key knowledge points, and if they both prove to be cost effective, ABL will become the boost phase element of the BMDS and land-based KEI with MKV will become the mobile upgrade to the midcourse element.

4. Senator SESSIONS. General Obering, could one consider KEI in a broader context as the block upgrade to current interceptors like Ground-Based Interceptor (GBI) and SM-3?

General OBERING. The mobile KEI capabilities complement our fixed site GBI and sea-based SM-3 interceptor investments. The MDA is pursuing the KEI to fill BMDS boost/ascent and midcourse phase performance gaps that require a mobile, high acceleration and heavy lift booster as an enabling capability. Our initial focus is a land-based KEI with a future evolution option of sea-basing. We are working with the Navy in fiscal year 2006 and fiscal year 2007 to select the best value sea-based platform for KEI integration. This mobile booster capability cannot be achieved via modifications to the existing GBI or SM-3 systems. We need a new design, based on mature component technologies, to perform the boost/ascent phase mission; we also need a range of high-payoff mobile midcourse defense responses, such as a forward-based KEI to deliver heavy payloads such as MKV or other advanced discrimination payloads that engage the threat early in its flight prior to subsequent GBI or SM-3 shots. The early boost/ascent and midcourse shots that the KEI capability offers is an important evolutionary element of our layered defense strategy to keep pace with the threat.

5. Senator SESSIONS. General Obering, the fiscal year 2007 budget request for KEI (\$406 million) is almost double last year's appropriation. Can you execute such a steep increase?

General OBERING. Yes. I am very confident we can execute the budget request and deliver the promised products. The KEI program enters a period of significant hardware development and test next year. Booster flight detailed design, long lead procurements, avionics ground tests, and four rocket motor static fires account for a significant portion of the 2007 budget request. We are also continuing a series of important fire control tests to prove out our capability to engage ballistic missiles with kinetic weapons in the boost and ascent phases of flight. In addition, the program is executing critical systems engineering and test infrastructure work across all the integrated product teams leading to a System Design Review event in July 2007. Our KEI team (Government, prime contractor, and suppliers) has a detailed plan in place for executing the fiscal year 2007 work packages. All fiscal year 2007 activities and risk reduction tie to the agency's 2008 knowledge-based decision point.

CONCURRENT TEST AND OPERATIONS

6. Senator SESSIONS. Mr. Duma, today, if we need to bring the Ground-Based Missile Defense (GMD) system into alert status, this means the system cannot be used for testing. Maintaining both alert status and a testing program places increasing strain on man and machine. Your written testimony notes that "Over the long term,

MDA should incrementally develop a capability to support concurrent testing and operations. . .” Why do you say that?

Mr. DUMA. The capability to test and train on the operational configured GMD system as it evolves is critical to ensuring the effectiveness, suitability, and readiness of the integrated fielded capability. Currently, MDA has funded additional equipment in fiscal year 2006 that will allow the GMD element to achieve a limited initial concurrent test and operations capability. Collectively, we must define, fund, develop, and employ a concurrent test and operations capability for the full BMDS. The full BMDS capability should be similar in concept to the capability that the Cheyenne Mountain Upgrade program acquired and used for training and testing the “on-line” Integrated Tactical Warning and Attack Assessment mission capability. I support a solution that provides robust end-to-end system-level testing that evaluates the full tactical hardware and software. The concurrent test and operations solution should allow MDA to test the fully integrated operational system, flight test interceptors, and launch equipment using warfighters and operational tactics, techniques, and procedures, while the combatant commands maintain an on-alert posture for the BMDS.

7. Senator SESSIONS. Mr. Duma, shouldn’t we have this capability as soon as possible to ensure the operational effectiveness of the GMD system, even while we continue to test to improve the system?

Mr. DUMA. Yes. In fact, the GMD element has funded additional equipment in fiscal year 2006 that will allow the GMD element to achieve a limited initial concurrent test and operations capability. However, as MDA integrates additional defensive capability into BMDS, a corresponding concurrent test and operations capability should be developed and employed. This concurrent test and operations capability must reflect the operational configuration of the full BMDS capability.

BASE REALIGNMENT AND CLOSURE RELATED EFFORTS

8. Senator SESSIONS. General Dodgen, please provide me a current status of your base realignment and closure (BRAC) related efforts and your move to Redstone Arsenal.

General DODGEN. We are making rapid progress in complying with the BRAC directive to relocate the U.S. Army Space and Missile Defense headquarters element to Redstone Arsenal, Alabama. Since the command presently occupies the initial facility at the Von Braun Complex on Redstone Arsenal, our relocation is not slowed due to construction or leasing of necessary facilities. We have developed an implementation plan that takes care of our employees and ensures continuity of operations for the command. Rotating military personnel, along with civilians desiring to move with the command, will start to report to Redstone this summer. We anticipate compliance with the BRAC directive by 30 September 2007.

9. Senator SESSIONS. General Obering, would you comment on the current status of BRAC preparation undertaken by the MDA. I know your task is much larger than General Dodgen’s. Specifically, are you aware of a special emergency military construction (MILCON) supplemental designed to provide you more funds for your projects in the FYDP? I do not believe there is such a thing.

General OBERING. The MDA is committed to implementing the BRAC initiatives. We are working with the DOD and the Army Corps of Engineers to develop a realistic BRAC MILCON funding request to support the necessary construction at Redstone Arsenal, Alabama and Fort Belvoir, Virginia to accommodate BRAC move requirements. We are not aware of any special emergency military construction supplemental designed to provide MDA more funds for BRAC projects.

10. Senator SESSIONS. General Obering, what are your MILCON concerns at this time impacting execution in fiscal year 2008?

General OBERING. The MDA is committed to implementing its BRAC recommendation within the statutory 6-year implementation period. We are working with the DOD and the Army to develop an implementation plan to both define the requirement and establish its phasing.

11. Senator SESSIONS. General Obering, you and I work closely together, can we expect to have all the money we need in the fiscal year 2008 MILCON budget to cover the three buildings required to house the MDA and Redstone Arsenal?

General OBERING. The Department is committed to fully funding all BRAC recommendations.

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

POSSIBILITY THAT GMD TESTING WILL NOT SUCCEED

12. Senator LEVIN. Mr. Duma, at the hearing there was some confusion about a question I asked concerning whether it is possible that the GMD test program will not demonstrate success, and thus will not provide confidence that the system is operationally effective. Just as there is a possibility that the testing will prove successful, is there a possibility that it will not prove successful, and that it will not demonstrate that it is operationally effective?

Mr. DUMA. Yes, there is always a possibility that testing of any acquisition program will show that it is not effective and suitable.

DOD INSPECTOR GENERAL REPORT

13. Senator LEVIN. General Obering, a recent DOD Inspector General (IG) report concluded, among other things, that the MDA “had not completed a systems engineering plan or planned fully for system sustainment. Therefore, the MDA is at risk of not successfully developing an integrated BMDS.” There are other findings and recommendations in the report. Given the hundreds of millions of dollars that the MDA spends on systems engineering, and the primacy of the objective to develop an integrated missile defense system, this appears to be a remarkable finding. Can you explain how these lapses in system engineering planning occurred and what you are doing to resolve them?

General OBERING. The MDA takes seriously the recommendations contained in the DOD IG’s report. In our reply of 3 April 2006, MDA noted that MDA Systems Engineering developed an initial BMDS Systems Engineering Process to reflect a capability-based, spiral acquisition methodology—quite unlike other traditional processes. The DOD IG concurred with our comments and stated MDA provided systems engineering guidance to the elements of the BMDS.

This process was implemented for the BMDS as part of Block 04. In collaboration with the BMDS elements, this process was modified, through the MDA Configuration Control Board, for BMDS Block 06 and is being documented in the BMDS System Engineering Plan that will be released this spring. When released, the plan will be distributed agency-wide to reestablish consistent guidance across the BMDS.

14. Senator LEVIN. General Obering, have you provided your responses to the IG’s office, as was requested by April 3?

General OBERING. Yes. On 3 April 2006 MDA provided a full response to the DOD IG to the Final Audit Report #D-2006-060 for the Audit of Systems Engineering Planning for the BMDS.

15. Senator LEVIN. General Obering, the report also indicates that MDA revised its “policy so that auditors from the DOD Office of IG receive expeditious and unrestricted access to documents in future audits.” Was it MDA policy previously not to provide such expeditious and unrestricted access to IG auditors?

General OBERING. No. MDA policy is, and has always been, to cooperate with audit agencies, respond constructively and promptly, and take appropriate corrective actions based on audit agencies’ reports. Additionally, it is MDA policy that all MDA staff cooperates with auditors and provides accurate, complete information pertinent to the subject under review and responds expeditiously to audit agencies’ requests.

SPACE-BASED BMD WEAPONS

16. Senator LEVIN. General Obering, does the planned funding for the space “test bed” put the country on a course to deploy weapons in space?

General OBERING. Developing a space test bed does not necessarily put the United States on a course to deploy weapons in space. We need to integrate space capabilities into the BMDS in order to ensure global access and meet the evolving threat. The space test bed will allow us to assess the ability of existing and future space systems to support the missile defense mission area, particularly in the areas of global communications and sensor capability. These systems will have value to the BMDS regardless of any particular interceptor basing mode.

We also plan to explore the addition of a space-based defensive layer to complement the evolutionary BMDS. We believe that a mix of terrestrial and space-basing offers the most effective global defense against ballistic missiles. Initially, funding will be used to conduct focused sensor and communications experiments demonstrating the viability of space based capabilities for the BMDS. MDA believes it

is prudent to conduct experimentation to understand what it is capable and what is not capable in that regard.

COOPERATION WITH RUSSIA

17. Senator LEVIN. Secretary Flory, your prepared testimony states that “we are negotiating a Defense Technical Cooperation Agreement with Russia to facilitate both government-to-government as well as industry-to-industry missile defense cooperation, while we continue to seek practical areas of cooperation with Russia on a bilateral basis as well as in the NATO-Russia context.” We have not yet had any substantial success in such cooperation. Section 1226 of last year’s National Defense Authorization Act expressed the support of Congress for such cooperation, and suggested a number of specific ideas. What has the Department done on those ideas, and what progress do you expect from the current efforts?

Mr. DUMA. The Russian Government has told us that they do not want to agree to any missile defense cooperative projects until both sides agree on a Defense Technical Cooperation Agreement. The USG has respected those wishes.

In the meantime, the DOD has pursued several transparency initiatives. In September 2005, we informed the Russian Government about an upcoming test of the U.S. missile defense system because the flight path of the test missile was relatively close to Russian territory. DOD invited the Russian Government to send an official to observe the test and to receive a briefing. Defense Minister Ivanov subsequently sent a message to Secretary Rumsfeld thanking him for inviting an observer and stating that such concrete steps demonstrated a new level of trust in the relationship between the two armed forces. In addition, DOD has regularly briefed senior Russian officials on our missile defense programs.

DOD has also pursued a series of missile defense exercises with the Russian armed forces. These exercises alternate between Moscow and the United States. Their purpose is to establish procedures that will allow both militaries to operate missile defenses cooperatively in the event that they deploy under combat conditions in the same theatre. Hundreds of military personnel have participated in these exercises on both sides.

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

SECTION 234 TEST PLAN

18. Senator BILL NELSON. Mr. Duma, at the hearing there seemed to be some confusion on the issue of the question on the status of section 234 of Public Law 109–163. My question related to the status of implementation of the test plan for Block 2006, as required by section 234, rather than the Integrated Master Test Plan. Since we are already in Block 06, the test plan should be available to influence the testing activities for Block 2006. What is the current status of the effort to prepare the test plan and who is participating?

Mr. DUMA. The Service Operational Test Agencies prepared the Ballistic Missile Defense Operational Assessment Plan, in coordination with my office and the MDA. I approved the plan on June 30, 2006, and sent copies to the Secretary of Defense and the Defense Committees.

19. Senator BILL NELSON. Mr. Duma, is there any current holdup to the preparation of the plan? If so, what is it?

Mr. DUMA. No. The Service Operational Test Agencies prepared the Ballistic Missile Defense Operational Assessment Plan, in coordination with my office and the MDA. I approved the plan on June 30, 2006, and sent copies to the Secretary of Defense and the Defense Committees.

20. Senator BILL NELSON. Mr. Duma, when do you expect to receive the plan for your review and approval? Please notify the committee when you have received the plan, when you have approved the plan (assuming you do), and please send a copy of the approved plan.

Mr. DUMA. The Service Operational Test Agencies prepared the Ballistic Missile Defense Operational Assessment Plan, in coordination with my office and the MDA. I approved the plan on June 30, 2006, and sent copies to the Secretary of Defense and the Defense Committees.

EUROPEAN "THIRD SITE" ISSUES

21. Senator BILL NELSON. General Obering, the fiscal year 2007 budget request includes \$119 million in funding for a number of activities associated with designing and building a third deployment site for GBIs for the GMD system, including long-lead funds for 10 interceptors to deploy in Europe (GBIs 41–50). What is the total estimated cost of building the third site, building and deploying the 10 interceptors, and deploying the associated radars that would operate in conjunction with the interceptors?

General OBERING. Total costs associated with the planned European Activities are:

- \$1,650 million for European Missile Field including:
 - \$317 million for Launch Complex Hardware and Site Activation Support (Procurement and Installation of Silos, Launch Support Equipment), Interceptor Emplacement
 - \$141 million for Communications Equipment and Connectivity to the GMD Fire Control/Communication Network to Include Satellite and Secure Communication
 - \$669 million for Missile Field Construction: Planning and Design of the Site, Site Preparation, Construction of Supporting Facilities and Primary Mission Facilities
 - \$358 million for Government Furnished Equipment, Services, Management, and Program Protection
 - \$165 million for System Engineering, Sub-System Checkout Testing, Embedded Test Node, and System Test Lab Upgrade
- \$484 million for Block 2010 GBIs (Procurement and Integration of 10 Kill Vehicles and 10 Boosters)
- \$603 million is the current estimated costs for C2BMC, from fiscal years 2008–2011. This cost includes development of the site; equipment installation costs; procurement or connection of the Defense Satellite Communication System (DSCS); and operation and support costs
- \$220 million is the current estimated costs to upgrade, transport, and site the GBR–P to the European Site. However, funding for this effort is not contained in the fiscal year 2007 President's budget submit
- \$46.4 million is the current estimated costs to deployment and site construction of FBX–T

Finally, the success of the European Site requires the use of a midcourse sensor (GBR–P) or a forward based radar (FBX–T) working in concert with forward deployed interceptors. Optimally, all three elements, the European Site interceptor field, the midcourse sensor, and a forward-based radar, provide the best missile defense coverage for the U.S. and European friends and allies. However, a forward based radar, deployed in the European area of operations as a stand-alone system, still significantly enhances U.S. based interceptor fields' (Fort Greely and Vandenberg Air Force Bases) ability to defend against emerging ballistic missile threats within the region.

22. Senator BILL NELSON. General Obering, is it correct that the United States is expecting to pay for these costs, other than some in-kind contributions provided by the relevant host nation?

General OBERING. Yes. The costs for the missile defense site in Europe we have provided you will be paid by the United States.

23. Senator BILL NELSON. General Obering, which nations is the system supposed to protect against a potential future Iranian long-range missile threat?

General OBERING. A European third GBI site will protect the United States against a potential future Iranian long-range ballistic missile threat (range greater than 5,500 kilometers) and Europe against both a potential future Iranian intermediate range ballistic missile threat (range from 3,000 to 5,500 kilometers) and also some medium-range ballistic missile threats (approximate ranges of 2,500 to 3,000 kilometers). The amount of protection is dependent both on the placement of the site and on the placement of a search and track sensor on the European continent.

24. Senator BILL NELSON. General Obering, is it the U.S., is it part of Europe, or a combination?

General OBERING. It is a combination of protection of both the United States and Europe. A European third GBI site will protect the United States against a poten-

tial future Iranian long-range ballistic missile threat (range greater than 5,500 kilometers) and Europe against both a potential future Iranian intermediate range ballistic missile threat (range from 3,000 to 5,500 kilometers) and also some medium range ballistic missile threats (approximate ranges of 2,500 to 3,000 kilometers). The amount of protection is dependent both on the placement of the interceptor site and on the forward placement of a search and track sensor on the European continent.

EUROPEAN GBI EFFECTIVENESS AGAINST A THEATER MISSILE

25. Senator BILL NELSON. General Obering, if Iran wanted to strike targets in Europe with ballistic missiles, it appears that they could develop a regional missile before they would develop an intercontinental missile. Would the GMD/GBI third site system be effective in defending Europe against Iranian medium-range or intermediate-range missiles?

General OBERING. It is reasonable to expect that Iran would develop a regional ballistic missile before they would develop an intercontinental ballistic missile (ICBM) (range greater than 5,500 kilometers). A regional ballistic missile would be the equivalent of what MDA defines as intermediate range ballistic missiles (range from 3,000 to 5,500 kilometers) and medium range ballistic missiles (range from 1,000 to 3,000 kilometers). A European GBI site would be effective in defending Europe against Iranian regional ballistic missiles depending on the range. The GBI could defend against Iranian intermediate range ballistic missiles (range from 3,000 to 5,500 kilometers) and some medium range ballistic missiles (approximately 2,500 to 3,000 kilometers). Other BMDS assets such as THAAD and Aegis BMD do provide defense against medium-range ballistic missiles including those in the range of 1,000 to 2,000 kilometers.

ROGUE INTERCONTINENTAL BALLISTIC MISSILE THREAT TO UNITED STATES

26. Senator BILL NELSON. General Obering and General Dodgen, at our worldwide threats hearing in February, the Director of National Intelligence (DNI), Ambassador Negroponte, and the Director of the Defense Intelligence Agency (DDIA), General Maples, did not even mention in their prepared testimony the efforts of North Korea or Iran to develop long-range ballistic missiles. They did discuss their efforts to develop regional missiles. In answer to a question about North Korea, General Maples said: "We assess that they are in the process of developing an ICBM that would be capable of delivering a nuclear warhead, but they have not done so yet, nor have they tested it."

At a later hearing, General Bell, Commander of U.S. Forces Korea, said that he agreed with General Maples' characterization of North Korea's ballistic missile programs, and added that: "Up through the late 1990s, there was a fairly active program in North Korea to develop that missile technology and potentially to test it. In the years since the late 1990s, the last 6 years, 7 years, we have seen very little activity by the North Koreans to actively continue to develop and test long-range missile systems. There is no doubt in my mind that they have the capability to begin more technological investigation and to begin a regimen to lead to testing and potentially to lead to fielding. But there's no evidence of it right now." Do you agree or disagree with these assessments of the DNI, DDIA, and the Commander of U.S. Forces Korea?

General OBERING. MDA has no basis upon which to disagree with the DNI, DDIA, and General Bell's intelligence assessments. MDA relies on Intelligence Community (IC) assessments as one portion of the range of threats that the BMDS is designed to protect against. As the system developer, MDA is not in a position to provide or assess intelligence, or to generate requirements. Rather, MDA must develop the BMDS based on current assessment of not only what is intelligence based, but what is within the realm of the possible engineering so as not to be surprised. The BMDS must look beyond assessments of current potential adversary capabilities to ensure the ability of the United States to deal with unforeseen future threats. MDA's evolutionary acquisition program, therefore, addresses the evolving ballistic missile threat.

General DODGEN. I concur with the threat assessments made by Ambassador Negroponte, General Maples, and General Bell during their recent testimony concerning North Korea's ICBM development efforts. In August 1998, North Korea did demonstrate a rudimentary capability to launch a long-range ballistic missile airframe. Although we have seen very little activity to actively develop and test an ICBM since that event, we believe the North Korean regime still continues to pur-

sue and develop ballistic missile/space launch technology that can be used to advance their long-range missile capabilities. From a warfighter perspective, it cannot be overlooked that North Korean has recently developed and tested other classes of ballistic missiles and have continued to pursue opportunities to export these capabilities to other countries on numerous occasions. The significant evidence of a continuously improving North Korean ballistic missile capability, with the added intent to export, certainly should continue to motivate our desires to stay ahead of the proliferating threat with our missile defense programs.

CHANGING DOD OVERSIGHT OF BMD PROGRAMS

27. Senator BILL NELSON. General Obering, Mr. Duma's prepared testimony described briefly a changing DOD oversight structure for the BMD System and program, consistent with the Quadrennial Defense Review. His statement mentions a new BMD Executive Board. Could you describe the proposed new structure and your role in implementing it?

General OBERING. This Executive Board, with membership drawn from OSD, the Services, Joint Chiefs of Staff (JCS), and STRATCOM, will recommend and oversee implementation of strategic policies and plans, program priorities, and investment options to protect our Nation and our allies from any form of ballistic missile attack. The Board will provide guidance to MDA as it develops and fields initial capabilities and conducts spiral development to upgrade the elements and components that make up the BMDS. The Board will also consider the evolving priorities and requirements of the warfighting community as it formulates recommendations on the way forward in missile defense.

The BMD Executive Board will enhance the DOD's decisionmaking process by focusing exclusively on issues related to the BMDS. The precise details of the charter, including the membership and decision authority of the BMD Executive Board, are still being determined.

28. Senator BILL NELSON. General Obering, how do you believe it will improve oversight of the BMD program, and when do you expect the new Executive Board will be in place?

General OBERING. In 2001 the Secretary of Defense formed the Senior Executive Council (SEC) to provide counsel on the application of sound business practices across the DOD. BMD is one of a broad range of mission areas overseen by the SEC. The BMD Executive Board will not have decision authority like the SEC, but it will help enhance the Department's decision making process by focusing exclusively on issues related to the BMDS.

The Board, with senior official membership drawn from OSD, the Services, JCS, and STRATCOM, will recommend and oversee implementation of strategic policies and plans, program priorities, and investment options to protect our Nation and our allies from any form of ballistic missile attack. The Board will incorporate evolving requirements into a comprehensive acquisition strategy to develop and field operational missile defense capability. It will improve information flow among key stakeholders: the MDA, Office of the Secretary of Defense, combatant commanders, DOD components, the Joint Staff, and the National Security Council and IC. The Board will establish a viable means to achieve our goals within the context of technical capability and established resource levels.

The Board will guide new ideas and technologies as they develop into initial capabilities, and subsequently into fully mature solutions ready for fielding and inclusion into the missile defense system. The Board will also consider the evolving priorities and requirements of the warfighting community as it formulates recommendations on the way forward.

I expect the BMD Executive Board will be in place by some time this summer.

U.S.-ISRAEL MISSILE DEFENSE COOPERATION

29. Senator BILL NELSON. General Obering, for years, the United States has been concerned with the aggressive nature of Iran and its desire to develop a nuclear weapons capability and the missile systems to deliver it. Israel, in partnership with the United States, has been focused on the advanced development, production, and deployment of an anti-ballistic missile system called the Arrow. I understand that the Arrow is the only Israeli system deployed that can address this threat. Given the growing missile threat in the Middle East, can we do more to accelerate the production of the Arrow anti-ballistic missile system, increase deterrence in the region, and help stabilize the situation?

General OBERING. Since 1986, the United States and Israel have jointly developed the Arrow Weapon System (AWS) to provide Israel an indigenous capability to defend against short- and medium-range ballistic missiles. The current focus of the Arrow System Improvement Program (ASIP) is to upgrade the AWS to counter evolving longer-range and more challenging ballistic missile threats. The current ASIP program ends in fiscal year 2008.

- Israel seeks to develop a “hermetic” or zero leakage defense system. The Israeli Ministry of Defense has identified new threats in the region with non-conventional capabilities. While the current Israeli Missile Defense Architecture has some capability against these emerging threats, it does not provide an adequate number of opportunities to ensure a zero leakage defense.
- The Israel Missile Defense Organization wants to start discussions in fiscal year 2007 regarding a possible post-ASIP program to counter emerging threats. They have requested an additional \$8 million to start a joint study and conceptual design of the necessary enhancements. The proposed post-ASIP program, Arrow Missile Segment Enhancement program, will add an upper-tier level of defense to the current Arrow II interceptor to provide additional engagement opportunities.
- MDA has expected a follow-on program to begin at the conclusion of the current ASIP agreement. This program is outlined in the President’s budget as “Arrow Block 5” and includes \$55.0 million in fiscal year 2009, \$57.7 million in fiscal year 2010, and \$59.4 million in fiscal year 2011. While MDA plans for a follow-on program to continue Arrow enhancements, there are indications that the ASIP program may slip into fiscal year 2009 and recommends focusing on the current Arrow program vice beginning any follow-on program. Additionally, MDA recommends looking at U.S. systems (like THAAD) to satisfy the Israeli requirements for an upper tier system to meet this growing threat.

30. Senator BILL NELSON. General Obering, if Congress were to authorize and appropriate additional funds for Arrow coproduction, is there the necessary production capability to execute the program?

General OBERING. Yes.

Background: Since 2004, this program has enabled Boeing to support Israel Aircraft Industries (IAI) in producing components for the Arrow interceptor, increasing monthly production capabilities by 300 percent and thus drastically shortening the acquisition time line for reaching Israeli Air Force’s operational requirements. Components produced by Boeing are shipped to IAI for final integration and assembly. On 29 September 2005, the first coproduced Arrow Interceptor was delivered to the Israel Missile Defense Organization.

- The State of Israel has requested an additional \$50 million for fiscal year 2007. This would be an addition to the \$13 million from the President’s budget request for Arrow Weapon System coproduction to make further progress towards meeting Israel’s defense requirements. Each Coproduced Arrow II Interceptor costs \$2.6 million.
- MDA has budgeted \$13 million in fiscal year 2007 for coproduction. Israel plans to contribute \$6 million (should additional U.S. funding be provided), Israeli will increase their contribution to maintain the 67 percent/33 percent cost share. If Israel receives this add, this will be the last year for the coproduction program as Arrow II interceptor inventory will meet Israeli Air Force requirements. Due to this, there is minimal benefit to increasing production to reduce the acquisition time line.

31. Senator BILL NELSON. General Obering, research and development on technologies that protect against additional threats such as shorter range ballistic missiles and cruise missiles may also benefit from Arrow’s mature capability. I understand MDA has programmed \$2.0 million for fiscal year 2007, in addition to funds already provided by Congress for fiscal year 2006. What would this funding accomplish by the end of fiscal year 2007 and what is the plan to continue this research in 2008 and beyond?

General OBERING. These funds were to be used in the U.S. for a study to explore possible U.S. benefits from the Israeli Short Range Ballistic Missile Defense (SRBMD) system. At this time MDA has not committed to the SRBMD program and is not seeking funding for this effort.

Background: In March 2005, Israel initiated an 18-month feasibility study of a low-cost SRBMD capability as an enhancement to the AWS. Israel requires a wide-

area active defense system against the current and growing threat to Israeli civilians from short-range, relatively low-tech, and inexpensive ballistic missiles. The current Israeli Missile Defense Architecture (Patriot and Arrow) has capability against some of these short-range missile threats but does not provide a cost-effective defense. The goal is \$300,000 per missile cost vs. the \$2–3 million per Arrow or Patriot missile. For fiscal year 2006, Congress made \$10 million available for a joint feasibility study designated the SRBMD initiative.

- For fiscal year 2007, Israel requested an additional \$25 million to begin the first phase of Full Scale Development of a short-range BMDS. The goal for fiscal year 2007 is to complete the Preliminary Design Review.
- For fiscal year 2008 and beyond, Israel plans on requesting \$40 million a year to continue Full Scale Development. Additionally, MDA's independent cost analysis estimate of total research and development and production costs for this proposed short-range system is \$500 million.

[Whereupon at 12:44 p.m., the subcommittee adjourned.]

**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2007**

THURSDAY, APRIL 6, 2006

U.S. SENATE
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

MILITARY SPACE PROGRAMS

The subcommittee met, pursuant to notice, at 3:34 p.m. in room SR-222, Russell Senate Office Building, Senator Jeff Sessions (chairman of the subcommittee) presiding.

Committee members present: Senators Sessions, Thune, Reed, and Bill Nelson.

Majority staff member present: Robert M. Soofer, professional staff member.

Minority staff members present: Madelyn R. Creedon, minority counsel; and Arun A. Seraphin, professional staff member.

Staff assistants present: Jill L. Simodejka and Pendred K. Wilson.

Committee members' assistants present: Arch Galloway II, assistant to Senator Sessions; Clyde A. Taylor IV, assistant to Senator Chambliss; Mieke Y. Eoyang, assistant to Senator Kennedy; Erik Raven, assistant to Senator Byrd; and William K. Sutey, assistant to Senator Bill Nelson.

STATEMENT OF SENATOR JEFF SESSIONS, CHAIRMAN

Senator SESSIONS. The hearing will come to order.

Senator Reed, we're glad you're with us, and I think Senator Nelson will join us. I'm pleased to welcome our witnesses today, the Honorable Ronald M. Sega, Under Secretary of the Air Force and Department of Defense (DOD) Executive Agent for Space, a dual hat there; Lieutenant General Kevin P. Chilton, USAF, Strategic Command's Joint Functional Component Commander for Space and Global Strike; Lieutenant General Michael A. Hamel, USAF, Commander of the Air Force Space and Missile Systems Center; Rear Admiral Kenneth W. Deutsch, USN?

Admiral DEUTSCH. Sprechen sie Deutsch, sir.

Senator SESSIONS. Deutsch. Right? Nein. [Laughter.]

You're the Director of the Net-Centric Warfare Division for the Navy.

Admiral DEUTSCH. Yes, sir.

Senator SESSIONS. Ms. Cristina T. Chaplain—and that’s the correct pronunciation?

Ms. CHAPLAIN. Yes.

Senator SESSIONS. Ms. Chaplain is the Acting Director for Acquisition and Sourcing Management for the United States Government Accountability Office (GAO). So, you’re the independent evaluator here, and we appreciate your report and opinion.

I thank the witnesses for taking time to be with us, and for their continuing commitment to our Nation’s security.

The subcommittee today meets to receive testimony on the military space programs of the DOD in review of the National Defense Authorization Request for Fiscal Year 2007. The subcommittee intends to address the budgetary and programmatic aspects of satellite and space launch programs and to investigate the progress that has been made by the DOD to improve the space acquisition process that had some difficulties, for sure.

The fiscal year 2007 budget request for all nonclassified military activities is approximately \$10.5 billion, of which \$6 billion is for research and development (R&D), a large sum, \$2.3 billion is for procurement, and \$2.2 billion for operations and maintenance. The current generation of military space systems is being modernized in virtually every mission area: strategic missile warning, assured communications, navigations, and intelligence and surveillance.

I would just note that satellite capabilities are absolutely critical to the defense of our country, for the operation of all our military Services, effectively. Even the Army now, with their Future Combat Systems (FCS), is utterly dependent upon the capabilities that you procure and produce for us. But, at the same time, virtually all of our modernization programs have suffered substantial problems with regard to cost, schedule, and technical performance, which has been estimated to cost the taxpayers some \$1.7 billion in 2007 alone, so that’s a lot of money, and it’s a problem we need to address.

We welcome the new leadership in the Air Force space community and understand that this problem has been taken seriously, that you have moved quickly to effect reforms in the acquisition process. We hope to hear more about these reforms, in the hope of restoring congressional confidence in the acquisition of our military space programs. We want our Congress to feel confident about that when these budgetary requests come forward.

Finally, we intend to review the current state of U.S. military space capabilities in support of the warfighter, and, related to this, the progress and potential for smaller, less expensive, and less complex space assets to support the theater warfighter in a timely manner.

[The prepared statement by Senator Sessions follows:]

PREPARED STATEMENT BY SENATOR JEFF SESSIONS

The hearing will come to order. Senator Nelson, welcome. I am pleased to welcome our witnesses today: the Honorable Ronald M. Sega, Under Secretary of the Air Force and Department of Defense (DOD) Executive Agent for Space; Lieutenant General Kevin P. Chilton, USAF, Strategic Command’s Joint Functional Component Commander for Space and Global Strike; Lieutenant General Michael A. Hamel, USAF, Commander of the Air Force Space and Missile Systems Center; Rear Admiral Kenneth W. Deutsch, USN, Director of Net-Centric Warfare for the Navy; and Ms. Cristina T. Chaplain, Acting Director for Acquisition and Sourcing Management

for the U.S. Government Accountability Office. I thank the witnesses for taking time to be with us and for their continuing commitment to our Nation's security.

The subcommittee meets today to receive testimony on the military space programs of the DOD in review of the National Defense Authorization Request for Fiscal Year 2007. The subcommittee intends to address the budgetary and programmatic aspects of satellite and space launch platforms and investigate the progress that has been made by the process.

The fiscal year 2007 budget request for all nonclassified military space activities is approximately \$10.5 billion, of which \$6 billion is for research and development, \$2.3 billion for procurement, and \$2.2 billion for operations and maintenance.

The current generation of military space systems are being modernized in virtually every mission area: strategic missile warning; assured communications; navigation; and intelligence and surveillance. At the same time, virtually every modernization program has suffered substantial problems with regard to cost, schedule, and technical performance, which will cost the taxpayer some \$1.7 billion in fiscal year 2007 alone.

We welcome the new leadership in the Air Force space community and understand they have moved quickly to effect reforms in the acquisition process. We hope to hear today more about these reforms in the hope of restoring congressional confidence in the acquisition of our military space programs.

Finally, we intend to review the current state of U.S. military space capabilities in support of the warfighter and, related to this, the progress and potential for smaller, less expensive, and less complex space assets to support the theater warfighter in a timely manner.

Let me now recognize my distinguished ranking member, Senator Nelson of Florida, for any opening remarks he may have.

Senator SESSIONS. Senator Reed, if you would like to make some opening comments now, I'd be glad to receive those.

Senator REED. Thank you, Mr. Chairman. No, I don't. Senator Nelson might have some opening comments, but I'm interested in hearing the witnesses and thank them for being here today.

Senator SESSIONS. Well, good, and we appreciate you.

Someone has said, when you deal with programs, there are some questions that need to be asked. Is it a need or a want? We want a lot of things, but we may not need them all. If it is a need, when do we need it, and how much will it cost? How vital is that need compared to other needs that may be as vital, or more so? What are we going to have to give up to meet that need? So, those are some questions I think most of you understand and recognize as you do your jobs, but questions that are important.

Secretary Segal, we're delighted to have you with us. We'd be delighted to hear your comments at this time. We have about a 5-minute round for each of you to speak. You can also make your remarks a part of the record and make more limited remarks, if you choose.

Mr. Secretary?

STATEMENT OF HON. RONALD M. SEGA, UNDER SECRETARY OF THE AIR FORCE

Dr. SEGA. Thank you. Mr. Chairman, Senator Reed, and distinguished members of the committee, I'm honored to appear before you today to discuss national security space. I thank you for allowing the written statement to be included as part of the record.

As Under Secretary of the Air Force and the DOD Executive Agent for Space, I am committed to improving space capabilities upon which our commanders and forces depend to conduct their missions. I thank this committee and the entire Congress for your support to national security space efforts.

Today, I want to outline the importance of space to our warfighters, and focus on three key areas for national security, and actually highlighting, principally, one, in terms of acquisition.

During the last hurricane season, we witnessed weather satellites tracking hurricanes and rescuers using global positioning systems (GPS) and satellite imagery to direct relief efforts to the hardest hit areas, Hurricanes Katrina and Rita being the clearest examples.

I'd like to relate two lesser known examples of the effectiveness of space systems. My first example concerns space support to the humanitarian missions in the Philippines. Space capabilities played a key role in our relief effort for a massive mudslide that buried an entire village on the island of Leyte. Within hours of the disaster, a Hawaii Air National Guard Combat Communications Unit that was in the area on an exercise, and switched into real-world humanitarian relief. They used an Eagle Vision system to quickly merge some archival commercial satellite imagery with mapping software, called Falcon View, and produced photos and gridded maps of the area, enabling them to locate fields that aircrews could, in fact, operate out of. Then they used the Eagle Vision to order, collect, and process new commercial imagery of the affected area, and they shared this information with U.S. responders, as well as the Philippine government agencies. This included images that compared the area before and after the mudslide, and enabled the authorities to move effectively to plan the rescue and relief operations. This same Guard unit returned to Hawaii shortly thereafter and began, immediately, rescue and recovery efforts in the island of Kauai.

The second example comes from Operation Iraqi Freedom (OIF) specifically in March 2003. It was a planned night parachute drop by the Army's 173rd Airborne Brigade. Weather was rough during that time. Of course, the mountains in northern Iraq are also very rough, and Captain—now a Major-select—John Roberts was very concerned. I had the privilege of talking to him just a few weeks ago. He was at an undisclosed location in Iraq. His 10 years in Air Force service included 9 of which were directly assigned to U.S. Army units. He's eight jumps away from master jump wings. In March 2003, he was assigned to the 173rd Airborne Brigade in Italy. The plan was to jump into northern Iraq to secure that area.

The week prior, all predictions were the weather was going to be horrible on the planned jump night. Brigade Commander Still said, "This is the night, and got to make it work." John spent the week studying model satellite photos, talking to his counterparts in the weather area in U.S. Central Command (CENTCOM) and U.S. Air Force, Europe (USAFE). All the information was bad. On March 26, 2003, which is jump day, he was now down to using satellite imagery to review the predicted weather window, which he saw as 1 hour in length as a front would move past.

As he told me, he was betting his bars that day that the predicted short window of opportunity would lift and convinced the folks to change the takeoff time to match this weather time. Brigade in flight was on 16 C-17s. First 10 included troops numbering over 1,000, as I understand it, and the second group of, in this case 6, was with the equipment. An hour out, the ground team said the

weather was still no-go, 800-foot ceilings, blowing snow. John came on the satellite phone to the brigade commander in the C-17 and convinced him to proceed, obviously keeping an eye on this weather satellite imagery. Thirty minutes out, the weather's still bad. Fifteen minutes out, the sky begins to clear, the jump happens on time. One hour after the jump, the weather closes back in. John landed the next day, the C-17, with this unit. For the Army folks, he could do no wrong.

So, that's one example of someone that has used satellites to full advantage to effect military operations. Major-select John Roberts will be heading in June to Alabama to teach at Maxwell Air Force Base.

Senator SESSIONS. That's a fabulous story. It's a life-and-death question, many times, with that capability. That's a good story.

Dr. SEGA. Thank you.

The satellite assets, as you have mentioned, Mr. Chairman, are essential at various levels of military in planning and operations, but clearly are also important to our economy, homeland security, and other disaster response activities.

I would like to focus on three areas of national security space. The first is to improve the integration of space capabilities across the national security space community, as well as with the air, land, and sea capabilities. The second area is to get back to basics in acquisition. I will go into that in a bit more detail. The third is to ensure the viability and proficiency of our space professionals and the science and technology workforce.

I would like to refer to this one chart I have over my right-hand shoulder.

The approach is a "back to basics" approach, and it has several components, one of which is to look at acquisition in terms of stages. This case, from the lower left of science and technology, building in technology maturity to a stage of technology development, to a next stage of systems development and systems production. The approach is to lower the risk in the system production phase while, at the same time, increasing risk that we take to push the frontiers hard in the science and technology, and, to a certain extent, the technology development phase.

The goal is to identify clearly the requirements and the technologies available as you start block one. So, as we build in maturity of the technologies from this lower stage and moving on up this chart, science and technology, technology development, systems development, reaching a stage of roughly technology readiness level six as we begin block one, but also we need to work with the users, very continuously, in a collaborative way as we identify what is in block one. As we ask the users, "What do you need?" we are now in dialogue. They're asking, "What do you have?" and converging on, "What is important that will meet needs in a specific time, with specific capability, with what we know we can build?" So, the end result should be a decrease of the acquisition cycle time.

Looking at program managers staying on for that reduced time through the extent of the block-one approach, technologies that are not ready for block one, we've relegated to later blocks. So, the requirements process is important, technology maturity is important,

fundamentals in systems engineering are important, cost estimation and schedule.

If I could give one example of this, is—what we have in the President's budget request in fiscal year 2007, is Transformational Satellite Communications System (TSAT). Through the Quadrennial Defense Review (QDR) process, the warfighters, combatant commanders (COCOMs), and folks in the Office of the Secretary of Defense (OSD) and the Services did an extensive review of what we should have, going forward, in the DOD. One of those capabilities was satellite communications.

It was determined, through that process, that the technologies that were identified as matured, not only identified by us internally, but also by GAO and Congress, constitute a block one.

Senator SESSIONS. Would you, we assume that those that are listening may understand what TSAT is, and most of us do, but maybe you can give us a quick synopsis of what you plan for the TSAT program. What its capabilities are?

Dr. SEGA. I certainly will.

Its name is derived from Transformational Satellite Communications System, and the main features that TSAT has that other satellites do not have includes a laser communications crosslink. So, with a laser communications crosslinks, the bandwidth, the capacity on that communications channel, is much higher than you can do with radio frequency (RF). The second major feature on that satellite is a router. It becomes a part of a network now in space. We have other pieces of our larger network that are being built that also provide the structure and the framework for network-centric operations. One of those would be the Joint Tactical Radio System (JTRS). It's becoming more of a communications node on the network.

The TSAT is a sophisticated communications system enabling us to more effectively communicate with Army forces, FCS, when they're on the move, and to bring the information back, as you would in a more modern Internet protocol packet-based system. Our current systems are like a switch, like the old operator that used to plug in from one wire of one person that wanted to communicate, and connect them to someone else with another wire at the operator station. What we have in space, is this switch of an operator connecting one to another. TSAT provides us a router in space at high bandwidth. That is a fundamental change from what we have done in the past, and it is an enabler for what we want to do in the future.

Now, we also, then, by reducing what we are expecting out of block one, reduce the weight of the satellite's estimate from over 5,000 pounds in the payload to less than 3,500 pounds. So, we began a more conservative approach of building this on time and on schedule.

Now, working with the warfighters, we also increased the bandwidth capacity on systems that we're well familiar with, KA band. Capability of the satellite actually was increased by a factor of two in this trade space that the technical community, the acquisition community, was making with the warfighters. In the budget request in 2007 is block one and some money that'll continue the systems development phase that will continue working on that tech-

nology that wasn't right, and then, when it is ready, move into satellites three, four, and beyond.

We also looked at the cost estimation. Consistent with GAO recommendations, the Young panel and others, what you see in the budget in fiscal year 2007 is an 80 percent confidence figure in terms of our budget estimates, as well. So, more conservative approach into the systems production phase of TSAT, as one example coming out of this budget request the block approach and incremental approach to continuing providing increased capability for the warfighter.

So, they will be getting a increased capability in a rhythm of arrival at fielded capabilities as we move on in time. The production base will also see a rhythm of production occurring in time, so there'll be more stability from a production standpoint.

We need to also be careful on how our investment portfolio looks, in terms of what is in the next-generation systems development, the one after that, technology development, and still the generation after that, science and technology, so it fits together? So, we're maturing technology as we move forward up the chart. We're also maturing our people, giving our folks more opportunity to get hands-on experience in these lower levels of this staged development. So, when they also are moving up in experience, they will have the technical instincts to be experienced managers as they move up to managing some of these more sophisticated systems.

So that's the block approach, going forward. That's an example, on the very large side.

On the smaller side is a renewed emphasis in smaller satellites. Here we're looking at going forward in a strategy of bringing together more of our laboratories and our product centers. So we have an example of that in XSS-11, that was scheduled to be built from start to finish in 36 months and around \$80 million. It was bumped onto a couple of different boosters, and it ended up at 39 months. It's been on orbit for almost a year now, and working quite effectively with the Air Force Research Laboratory at Kirtland Air Force Base, Space and Missile Systems Command, working there, and contractor Lockheed-Martin, being flown there, out of Albuquerque.

So, small satellites, and a subset of those are TacSats, tactical satellites, will be part of our future, going forward. It fits very well in this construct, also.

I've certainly taken quite a bit of time here.

Space is clearly important. I think we all share that. Mr. Chairman, I appreciate the continued support of Congress and this committee to ensure we have what is necessary to deliver vital capabilities to our warfighters. I thank you for the opportunity to appear before you today. I look forward to your questions.

[The prepared statement of Dr. Sega follows:]

PREPARED STATEMENT BY HON. RONALD M. SEGA

INTRODUCTION

It is my distinct honor to appear before the committee today to discuss our National Security Space activities as Under Secretary of the Air Force and Department of Defense (DOD) Executive Agent for Space. As the DOD Executive Agent for Space, my role is to "develop, coordinate, and integrate plans and programs for space systems and the acquisition of DOD space Major Defense Acquisition Pro-

grams to provide operational space force capabilities to ensure the United States has the space power to achieve its national security objectives.”

The President’s budget, released on February 6, 2006, “focuses taxpayer resources on national priorities like the war on terrorism, health care, energy research and strengthening our global competitiveness,” and includes defense spending to “maintain a high level of military readiness, develop and procure new weapon systems to ensure U.S. battlefield superiority, and support our service members and their families.” This budget “reflects the Department’s continued shift in emphasis away from the static posture and forces of the last century toward the highly mobile and expeditionary forces, and accompanying warfighting capabilities, needed in the century ahead.”

As discussed in the Secretary of the Air Force’s and Chief of Staff of the Air Force’s testimony in the 2006 Air Force Posture Statement, “The U.S. depends upon the Air Force to supply critical space capabilities to meet the needs of Joint operations worldwide, and also the needs of national missions across the instruments of diplomatic, informational, military and economic power.” These space capabilities enable the U.S. to assure allies, dissuade military competition, deter threats and decisively defeat adversaries. The National Security Space community must address the 21st century defense challenges by “modernizing critical capabilities across the spectrum of global strike, navigation, weather, communication, missile warning, launch, surveillance, counterspace and ground-based space systems.”

Today, I want to outline the importance of space to our warfighters and then focus on three key areas for national security space. The first is to improve the integration of space capabilities across the national security space community, as well as with air, land, and sea-based capabilities. The second area is to get “back-to-basics” in space acquisition. The third is to ensure the viability and proficiency of our space professionals and science and technology (S&T) workforce.

Before I discuss each of these areas, it is important to reiterate the importance of space capabilities to our Nation. Space pervades many aspects of everyday life in America. Space services enter homes, businesses, schools, hospitals, and government offices to affect transportation, health, telecommunications, weather forecasting, education, commerce, agriculture, and energy. Space services are transforming major aspects of commercial and social activity and will continue to do so as emerging technologies increase the satellite capabilities. Our Nation’s ability to respond to events around the world is heavily enabled by space-based capabilities whether defending our borders, facilitating disaster assistance at home or aiding disaster victims in the Far East.

From a military standpoint, leveraging our space capabilities provides the U.S. with an asymmetric advantage over our adversaries in our fight to win the “Long War,” the global war on terror. Today’s fast-paced military environment requires global connectivity between many fast-moving elements. Satellite communications (SATCOM) is the backbone that connects forces to allow an intercontinental flow of information whether in remote deserts or crowded urban terrain.

Space-based warning systems help to defend our forces abroad as well as the American homeland from ballistic missile attack. Successful cueing of defensive systems allows timely responses to attacks. This past December, the Under Secretary of Defense, Acquisitions, Technology and Logistics certified and restructured the Space Based Infrared System (SBIRS) High program. As part of the certification, it was determined that this program is essential to national security, there are no other lower cost alternatives, the program cost estimate is reasonable, and the management structure is adequate. The first Geosynchronous Earth Orbit satellite (GEO-1) is now planned to launch in fall 2008. Given the continued importance of the missions, the Department will work with Congress to initiate a new, competitor capability in parallel with the SBIRS program to ensure that the Nation’s missile warning capability is sustained and that support to theater and strategic missile defense, technical intelligence, and battlespace characterization is also achieved. This proposed program should exploit new technologies to provide the Department with additional options for making decisions related to these mission areas. The Department will also conduct enhanced oversight of the SBIRS program to ensure that cost, schedule, and performance are closely monitored.

Battle-space awareness, coupled with precision weapons such as those guided by Global Positioning System (GPS), allows our forces to successfully engage enemy targets with a minimal number of weapons and limited collateral damage. In fact, precision strike is no longer just a goal; it is an expectation.

Space-based ISR systems, by providing global presence and increasing persistence, provide data that make it possible for military commanders and national decision makers to lift the fog of war over the battlespace. Detailed information from space systems helps us utilize limited national resources more effectively. Only with space

systems can we consistently observe remote or denied areas to help us better prepare for and respond to threats. In addition to military applications, space-related capabilities also help national leaders make foreign policy decisions by supplying key data for diplomatic decisionmaking, helping verify treaty compliance, and monitoring diplomatic crises.

Future ISR systems, such as Space Radar, will give users more persistent, worldwide, day, night, and all-weather knowledge of enemy movement. When integrated with other space-based systems and terrestrial systems, this additional source of information will provide more robust battle space awareness.

Space capabilities also play an important role in disaster response and homeland security. For example, our weather satellites observed Hurricanes Katrina and Rita and provided data for forecasting their strengths and impacts. After these storms disrupted many normal means of navigation and communication, response teams relied on GPS for precise navigation and used SATCOM to coordinate their efforts. Space-derived data aided the disaster response in many ways to help alleviate the severity of these disasters.

Aside from commercial industries that use space services directly, space has a pervasive economic and social impact. Many banking and financial firms employ GPS timing to synchronize their encrypted computer networks. With the rise of computer-based stock trading and e-commerce, precise timing of transactions is becoming more important, and GPS is a key mechanism for distributing these necessary timing signals.

Maintaining the asymmetric advantages we enjoy today in space will continue to be vital to U.S. national security in the future. Operations in Afghanistan and Iraq clearly demonstrate that space-enabled warfare is the way we will fight current and future battles. Plans for future military capabilities across the entire DOD reflect this new reality. For example, the Army's Future Combat System (FCS) will operate in more complex battle environments requiring a mix of manned and unmanned systems connected by a network. To provide global connectivity, that network will rely on space-based communication systems. The Transformational Satellite (TSAT) Communications Program is being developed to support the extension of the Global Information Grid (GIG) to deployed and mobile users, allowing the warfighter and other users increased agility and effectiveness in dispersed, decentralized and constantly changing environments.

In order to provide continuous, reliable space services, we must ensure access to space. This past year I had the opportunity to witness the final Titan IV launch. Culminating a nearly 50 year history of the Titan program, this launch out of our West Coast facility at Vandenberg Air Force Base, extended a record 44 consecutive successful national security launches. We are maintaining this assured access to space by using the Evolved Expendable Launch Vehicles (EELV) as we simultaneously investigate new Operationally Responsive Space (ORS) launch options.

The Air Force is continuing its pursuit of ORS small satellite capabilities with the potential to rapidly deploy and employ communication, ISR, and other space capabilities. The range of opportunities for small satellites includes not only rapid response capabilities such as TACSATs, but also development of small satellites as standard elements or backups for global constellation operations, and as enablers for more aggressive S&T and technology/system development programs.

Since space capabilities are so vital to our defense as well as our everyday life, they must be protected. As we become more operationally tied to space systems, future adversaries will try to deny us the asymmetric advantages that space provides us. The Space Commission pointed out in 2001 that the U.S. is an attractive candidate for a "Space Pearl Harbor." We saw the beginnings of this with GPS jamming in Operation Iraqi Freedom (OIF). While the United States supports the peaceful use of space by all, it has been our Nation's policy since 1996 to ensure hostile forces cannot prevent our own use of space, and to counter, if necessary, space systems and services used for hostile purposes, preferably using temporary or reversible manners.

The first step in protecting our space capabilities is improving our Space Situation Awareness (SSA). SSA forms the foundation for all of space control and includes traditional space surveillance, collection and processing of space intelligence data, analysis of the space environment, and the fusion of these elements to contribute to a better understanding of the space domain.

Space control activities also emphasize the protection of our national security interests against potential vulnerabilities and rapidly evolving threats. We are increasing our focus on ensuring our assets will meet operational requirements in a growing and changing threat environment.

Our DOD Space areas of emphasis—integration, acquisition basic back to basics, and workforce development—are aimed at continued access and successful exploitation of space in support of our warfighters.

INTEGRATION OF NATIONAL SECURITY SPACE CAPABILITIES

Efficient operation of on-orbit and ground assets requires integrating space capabilities with other operational military systems and between the military and intelligence communities. While our space systems function well individually, we need them to work together for maximum effect on the battlefield. We have learned from our experience integrating air and space operations into Combined Air Operations Centers (CAOC) that our systems should complement one another rather than compete against each other. The best overall effect should be realized by a mix of integrated systems; combining orbiting platforms with manned and unmanned aircraft, ground-based assets, and other systems, linked together so they share data, and cue one another.

Space capabilities serve the interests of a wide array of stakeholders: the DOD, including the combatant commanders and fielded forces; the Department of State (DOS); the Department of Commerce; and the Director of National Intelligence (DNI) and the Intelligence Community. As the DOD Executive Agent for Space, I have had the opportunity to visit five of the combatant commands—Pacific Command (PACOM), Northern Command (NORTHCOM), Strategic Command (USSTRATCOM), Central Command (CENTCOM), and Special Operations Command (SOCOM)—to discuss first-hand their needs and requirements. I also work with the Joint Staff and the Army, Navy, and Air Force space components to gain similar insights. Through ongoing interaction with the Defense space acquisition community, government laboratories, Defense Advanced Research Projects Agency (DARPA), Federally Funded Research and Development Centers (FFRDCs), industry, academia, and the Director of the National Reconnaissance Office (DNRO), we are enhancing links between the warfighters and the acquisition community. In particular, the activities of the DOD Executive Agent for Space and the DNRO, Dr. Don Kerr, must be coordinated. I assure you that Don Kerr and I work closely together to provide continuity and focus to the overall National Security Space portfolio. This is especially important as we consider the need to improve planning, development, acquisition, and management of our space capabilities.

The government relies on a robust space industrial base to provide the systems, technologies, and services necessary to maintain our space capabilities. A good example is the commercial SATCOM industry. The DOD depends on a vast network of commercial ground and space-based systems to meet its telecommunications needs. In particular, commercial SATCOM is a large part of the space communication system that supports the warfighter. Current estimates are that commercial SATCOM provided about 60 percent of the wideband SATCOM during Operation Enduring Freedom and up to 80 percent of the SATCOM during OIF.

The strategic relevance of space as a force multiplier underscores the necessity for government to ensure we have a strong industrial base that will satisfy our requirements now and in the future. The Space Industrial Base Council, co-chaired by Dr. Kerr and myself, is a forum to address space industry issues and bring together stakeholders from across government to provide coordinated attention and action on space industrial base issues. We have also taken steps to include industry and academia to help inform and implement our initiatives.

BACK TO BASICS IN SPACE ACQUISITION

My second area of emphasis is to get “back to basics” in space acquisitions to maximize the probability for success in our space acquisition programs. Acquisition links technology with operations—turning ideas into real, tangible items and delivering those items to the field. It is a continuous process with four distinct but inter-related stages. The first stage is S&T, where we conduct basic research and explore the possibilities of new technologies. In the second, technology development, we evaluate the utility of discoveries made in the S&T stage. The third stage is systems development. Here, we take the most promising technologies and mature them to higher readiness levels so they can be integrated into operational platforms in the fourth stage, system production.

In this acquisition construct, technology is matured through the four stages to move from the lab bench to the test range to operations. We are emphasizing early technology development to ensure mature technology is available for our production systems. Basic research in science and technology generates knowledge and helps develop our scientists and engineers in our laboratories, universities, and research centers. This kind of cutting-edge work is inherently high risk—discoveries take

hard work and insight but are not predictable—but we want to take risk in the earlier stages. For instance, the Air Force Research Laboratory is exploring everything from material properties of beryllium-aluminum alloys, ceramic-matrix composites, and “aerogel”-based thermal insulation, to the operating characteristics of components and systems such as spinning disk lasers, and on-orbit vibration isolation systems. The DOD investment in space-related S&T has doubled over the last 4 years.

Once we find a promising technology, we investigate its utility in the Technology Development stage. For example, back in September, the STP-R1 experimental satellite—the “Streak”—launched from Vandenberg Air Force Base on a Minotaur rocket. It has a payload that will study the low Earth orbit environment, but also has an objective to demonstrate an approach of rapid response, short duration missions. It is one of many projects sponsored by the DARPA and run by the Air Force Space Test Program office at Kirtland.

Thus, in the two supporting stages of science and technology and technology development, the approach is to take more risk and push the frontier harder. We will allow those that are creating new ideas and exploring new technologies greater opportunity to push their ideas forward.

After we prove a concept or demonstrate the technology, we mature it until we are confident it will work reliably in space. We build that confidence and performance during the Systems Development stage, where we get new technologies ready to incorporate into operational systems.

The XSS-11, built at Kirtland Air Force Base and launched from Vandenberg Air Force Base last April, is an excellent example of a space Systems Development effort. The XSS-11 did more than prove a concept and check out technology and techniques for future space missions; it also helped improve the quality, experience and knowledge of our workforce. The program managers and engineers operated on a tight schedule and budget, and even after several technical problems and three different launch platforms they had the vehicle ready to launch within 3 months of the original 36-month development timeline and within a few million dollars of the original budget estimate. Finally, once we have mature technology, we move into the fourth stage, System Production. As an example, we launched the first modified Global Positioning System (GPS) IIR (GPS IIR-M) satellite in September 2005. It will provide the same GPS signals as earlier GPS IIRs, plus two new military signals and another civilian signal. Since the early GPS I series, the program has evolved through a block approach where each increment has provided additional capabilities. GPS satellites are operational assets used by troops in the field. We must minimize the risk involved as we produce these systems and in the System Production stage, we want to integrate mature technologies while employing a disciplined systems engineering process. We must also design in testability and modularity so that we have a path to spiral newly matured technologies into operational systems. We are reducing the risk in that final stage of System Production by starting with more matured technologies, more stable requirements, and more discipline in the systems design.

This idea of managing the risk, or apportioning risk in a more controlled manner is important. You can view it as a redistribution of risk where the higher risk is in those beginning stages while we lower the risk in System Production, incorporating only proven technologies and focusing on taking smaller, more manageable steps. By doing so, we allow a constant, ongoing rhythm of design, build, launch, and operate. I believe that developing this rhythm of activity will reduce the acquisition cycle time, insert stability into our production lines and workforce, and enable us to field better systems over time, all while increasing confidence in our production schedule and cost. Ultimately, the warfighter should receive a rhythm of needed, timely, affordable capability.

The restructured TSAT program reflects this new approach to meeting warfighter requirements through major discrete increments or blocks. The Quadrennial Defense Review (QDR) endorsed this TSAT approach as the way to begin accelerating some needed network capability for the warfighter. Consistent with congressional inputs, we have focused on technology maturity to define the first block for TSAT. The new program will reduce the risk for the first two satellites by providing basic laser communications capabilities and processor/routers in a Block 1 configuration. Higher risk technologies such as a more capable laser communication capability and more capable Internet Protocol Packet-based processing can be incorporated into later blocks of satellites. Block 1 directly corresponds to those technologies that the TSAT Program Office and Government Accountability Office agreed are mature consistent with this phase of the program. We also have increased the budgetary confidence levels of TSAT from 50 percent to 80 percent.

In addition, we recently announced an award of the TSAT Mission Operations System (TMOS) contract—the ground segment for TSAT. Going forward with TMOS

allows for better development and horizontal integration with other GIG systems. The networking capabilities provided by TMOS are the cornerstone to the future Military Communications Satellite architecture (AEHF and TSAT) and its interface with the GIG. Since the space segment interface requirements will be consistent with the TMOS design, our approach simplifies design trades for the space segment contractors. The TMOS contract source selection criteria also reflected a decision process which weighted proposal risk and contractor past performance over system mission capability and cost.

This overall approach reduces technology and integration risk and increases our confidence in timely delivery of capabilities to the warfighter—an approach consistent with the 2003 Young Panel recommendations. We are exploring this same approach for Space Radar and GPS III.

We also need to get back to basics in our acquisition practices. A back-to-basics approach hinges on: first, managing risk better; strengthening collaborations between the players involved in the acquisition process; implementing more rigorous systems engineering processes; and, improving the way we recruit and train our acquisitions workforce.

I previously mentioned the various National Security Space stakeholders. As we get back to basics, we need to strengthen collaboration across the space community between technical experts, acquisition personnel, logisticians, and operators to ensure we are developing the systems we really need. There must be an early, detailed dialogue between all the players on warfighters needs balanced against a realistic assessment of what capability can be provided. We are working with the Joint Staff and combatant commanders to implement this approach. We should be able to provide significant new capability quicker and be more cost effective while continuing to work towards the full stated objectives in later generations. For example, deliver a first increment/block of system capability that meets 70–80 percent of the original stated objectives in a more timely fashion while working toward greater capability in future blocks. Key to this effort is to implement and maintain strong discipline in developing and stabilizing system requirements—another facet of sound system engineering.

A critical part of implementing the back to basics philosophy is a heavy emphasis on applying proven systems engineering practices and raising the expertise of our systems engineers. The Air Force's Space and Missile Systems Center (SMC) has instituted a rigorous training program that includes classroom time, hands-on laboratory experience, Master's level courses, and education with industry. SMC has also captured best practices from across the community while working with the NRO, industry, FFRDCs, and technical societies to develop interface standards. One key aspect of improving the way we manage acquisition risk, and a key facet of our continuous emphasis on system engineering, is to better estimate the cost and schedule through a stronger cost estimation team and applying a more conservative approach in the System Production stage. If we have high confidence in the success of an acquisition program because we matured the technology starting with a strong S&T base, then we also have more confidence in our production cost and schedule estimates.

SPACE PROFESSIONALS/SCIENCE AND TECHNOLOGY WORKFORCE

We have a great team of space professionals in the military, civil service, and industry. We know that many of our experienced people are retiring and we need to focus on the basics of recruiting, training, and mentoring to balance out our space workforce and maintain a strong, dynamic cadre of space professionals—innovators, original thinkers, and people with solid engineering instincts.

To continue to develop, attract, and retain top talent, I urge you to continue supporting programs such as the National Defense Education Program (NDEP)—which started as a pilot program in fiscal year 2005 called the Science, Mathematics and Research for Transformation (SMART). NDEP targets undergraduates and graduate students studying science, math, and engineering. The President's fiscal year 2007 budget request (DOD-wide budget line) for NDEP is roughly twice that of the fiscal year 2006 request.

As important as it is to recruit and train talented performers, it is also important for us to give them the opportunity to work with increasing levels of technology, consistent with the four stages in the space acquisition framework. They should have the opportunity to develop program management and systems engineering skills and gain experience on progressively more complex systems. This will teach them what risks to take, how to make tough decisions, and expand their knowledge base. Science and Technology and Technology Development efforts provide excellent opportunities for this kind of growth.

Our efforts to increase the expertise of the space force are comprehensive. We provide oversight of the space cadre through the Space Professional Oversight Board, co-chaired by the DNRO and myself, which includes representatives from all military services. In addition, AFSPC's National Security Space Institute is expanding and recently completed checkout and startup of their 300 level training course, with the first offerings including students from all Services, National Aeronautics and Space Administration (NASA), and the National Reconnaissance Office (NRO).

Finally, we recently held the first National Security Space Program Manager's Conference to discuss, analyze, and exchange best practices and experiences. It was hosted by the Air Force's Space and Missile Center and attended by space acquisition officers from the Air Force, NRO, DARPA, Army, Navy, and the laboratories.

CONCLUSION

Space capabilities are essential at all levels of military planning and operations. To win the long war, we must leverage our space contributions along with all elements of national power. As the DOD Executive Agent for Space, I am confident that the directions outlined here will help us improve the way we use existing space assets, acquire new capabilities, and integrate with other stakeholders relying on the National Security Space community today and into the future. Thank you for the opportunity to present our approach and our emphasis on integration, back to basics in acquisition, and our space workforce.

I appreciate the continued support Congress and this committee have given to help deliver vital space capabilities, and I look forward to working with you.

Senator SESSIONS. Thank you.

Next is, I believe, Admiral Deutsch.

Admiral DEUTSCH. Thank you, sir. If I may, I'd like to just ask that my comments be introduced into your record, and unless you have any questions or a response that you'd like from me now, I'll save my comments for later.

[The prepared statement of Admiral Deutsch follows:]

PREPARED STATEMENT BY RADM KENNETH W. DEUTSCH, USN

Mr. Chairman, distinguished members of the committee, I am honored to appear before you today to address Navy space activities. As the acting Deputy Chief of Naval Operations for Communications Network, we provide the space and cyberspace capabilities necessary to support the warfighting efforts of the long war against terrorism and to support the naval forces of the future.

Space and cyberspace are critical to FORCEnet. FORCEnet, the means by which the power of sensors, networks, weapons, warriors and platforms are networked in a combat force, integrates Sea Strike, Sea Shield, Sea Basing, and Sea Shaping, the pillars of Sea Power 21. FORCEnet is the catalyst that makes naval transformation possible and will allow the Navy to support the long war against terror, defend the homeland, and counter potential adversaries.

SPACE SUPPORT TO THE NAVY WARFIGHTER

The 21st century environment is one of increasing challenges and complex environments, requiring greater speed of decision and precision in action. Warfare today and in the future is about speed—acting quickly in the global commons of the seas, space, and cyberspace before an adversary saturates or even penetrates our defenses. It will also be about persistence—having the duration and vantage point to find threats and counter them with precision. In the future, assured access to the spectrum of space capabilities will be the key to giving decision makers the advantage of speed and the forewarning of persistence to respond to the full range of military operations, from the global war on terror to major combat operations.

Admiral Spruance once defined Sea Power as “pushing our front lines as far forward as possible.” In addition to integrating space capabilities throughout the naval forces and shaping joint deliberations to assure combat effectiveness, we will work to push our front lines into space in order to meet future challenges. Navy ships at sea are extremely dependent on space-based assets for beyond line of sight communications, threat information and situational awareness. We want to be able to operate from the commons—sea, cyberspace and space—with a continuum of affordable options. The Navy is interested in space as a key part of FORCEnet. Integrating space capabilities, particularly military satellite communications, Intelligence Surveillance, and Reconnaissance (ISR), environmental sensing, and posi-

tion, navigation, and timing throughout the naval force to make space tactically relevant is fundamental to our Sea Power 21 vision.

THE NAVY'S INVESTMENT

The Navy's space investment portfolio reflects our partnership with the Department of Defense's (DOD) Executive Agent for Space and the rest of the National Security Space community—as well as our maritime responsibilities. We rely on the Air Force and National Reconnaissance Office (NRO) to acquire most of the major space platforms, collaborating on the required capabilities, and then we purchase user equipment for the fleet. The Navy's Space Cadre works closely with these entities, providing the leadership and technical expertise necessary to leverage the Navy's interests in space throughout the entire acquisition process. We also take the lead in tackling maritime challenges through our participation in the Science and Technology/Research and Development (S&T/R&D) process.

MOBILE USER OBJECTIVE SYSTEM

The Navy's major space segment responsibility to the joint community is the narrowband satellite communications constellation. Today it consists of Ultra-High Frequency (UHF) Follow-on UFO and will be replaced by Mobile User Objective System (MUOS) in 2010. The MUOS program is preparing for the Key Decision Point (C) Defense Space Acquisition Board in July 2006. The program is currently on cost and on schedule for an initial operational capability (IOC) in 2010. MUOS will provide "communications on the move", through double canopy foliage and in urban environments to small antennas used by disadvantaged users. MUOS is the common denominator for command and control providing the capability to communicate from tactical to theater levels, to allies and coalition partners and between defense and non-defense agencies. MUOS will allow a more comprehensive and coordinated approach to regional engagement, providing the capability to synchronize efforts with other Services, agencies, and allied nations.

MUOS is critical to satisfying the demand for tactical satellite communications. During Operation Enduring Freedom, UFO and LEASAT 5 were unable to support 20 percent of narrowband tactical UHF satellite communication requirements. Additionally, in the 2010 timeframe, LEASAT 5 will reach end of its service life and UFO is expected to reach an unacceptable level of availability in August 2009 leaving a potential gap before MUOS is operational. Complete loss of these UHF satellite communication resources would have a significant impact on combat operations if not replaced by MUOS. Today, UFO supports approximately 500 accesses worldwide. Based on evolving future warfighting concepts in support of the Defense Planning Guidance (DPG), access requirements have grown by at least a factor of four and MUOS as envisioned will be able to support that requirement. As Lockheed Martin refines its design, we expect this capacity to grow.

ORS

Keeping with the objective to maximize space support to the Navy Warfighter, we are interested in Operationally Responsive Space (ORS) because of its potential to provide a more affordable way to get beyond the line of sight of communication capabilities and rapid-reaction ISR sensors, on orbit, in a tactically relevant timeframe to respond to asymmetric challenges and hedge against uncertainty. In a resource-constrained environment, it is crucial to not over match capability to requirement. It is equally important to not under match capability to requirement, putting mission accomplishment and lives at risk. Increasing the options available for the warfighter with a balanced, tiered architecture for space capabilities increases the warfighter's ability to get exactly the right capability to match his need.

The Joint Task Force Commander needs a wide spectrum of options, capabilities, and timeframes to choose from to meet his operational requirement. ORS could offer an additional element in a tiered system that includes unmanned aerial vehicles, manned aircraft, high altitude air ships and traditional big space systems. It is a potentially cost effective way to provide the connectivity that the Sea Base needs to mass distributed forces effects. ORS can fill in gaps and provide options for space support in areas that lack sufficient coverage from national systems or reduce the vulnerability and uncertainty of depending on commercial satellite communications or sensors during times of conflict. ORS will be particularly useful for equipping the littoral combat ship with increased capability to monitor netted undersea sensors from standoff distances. It also offers potential for improving Maritime Domain Awareness (MDA). By working with existing space systems, ORS can help increase the revisit rate for contacts, which is the key to tracking in dense maritime shipping environments.

As part of the joint TacSat and ORS effort, the Office of Naval Research is investing \$15 million of S&T funds each year in moderate-to-high-risk projects that result in significant prototypes through the Space Innovative Naval Prototype program. Investments are focused on naval capability gaps that space can fill such as ship tracking, data exfiltration from buoys, submarine detection and cueing and littoral characterization. In addition to the Space Innovative Naval Prototype investment, Navy actively participates in the joint TacSat efforts along with Air Force Space Command, Air Force Research Lab (AFRL), U.S. Strategic Command (USSTRATCOM), Army and Marine Corps. Naval Research Lab (NRL) in coordination with the Office of Force Transformation built TacSat-1 with a shiptracking payload in less than 12 months for \$9.3 million plus \$5 million in space parts. It is awaiting launch on a new commercial launch vehicle from SpaceX this year. In coordination with AFRL, NRL is providing secondary payloads for TacSat-2 and TacSat-3. As the result of a joint selection process, NRL is designing and building TacSat-4 to provide communications on the move, data exfiltration from buoys and blue force tracking over a theater size area. The TacSat experiments are already making significant progress on developing consensus on standards and novel approaches to reduce costs for small satellites. The true test will be when the fleet and other users start to experiment with TacSats in an operational environment.

ORS also has the potential to change future space acquisition by introducing a new business model for space. The current TacSat series of S&T experiments, and the potential for a small satellite operations capability, can be viewed as an acquisition experiment. ORS cycle times dictate an acquisition business rhythm that acquires and delivers a capability quickly and is flexible enough to adapt to operator feedback to improve the next capability iteration. Development and acceptance of standards, use of a cyclical business process and cultivation of multiple vendors are all likely outcomes from ORS that have the potential to positively impact the Navy and joint warfighters.

SPACE CADRE

The Navy's success in effectively integrating space assets to enhance our naval force depends on the experience and the skill of the Navy Space Cadre. Vice Admiral McArthur, Commander, Naval Network Warfare Command, provides strategic guidance on priorities for the development and employment of the Navy Space Cadre as the Navy's Space Cadre Functional Authority. As a leader on the National Security Space-Space Professional Oversight Board (the senior officer forum for the discussion and resolution of matters concerning space professional development within the DOD), he led Navy participation in the development of the National Security Space Human Capital Strategy. He is updating the Navy Space Cadre's Strategy for Our People, which outlines our vision and way ahead.

The Navy Space Cadre is a distinct body of expertise horizontally and vertically integrated within the Navy's Active-Duty, Reserve, and civilian components organized to operationalize space. Members of Navy Space Cadre are assigned to the NRO, the National Security Space Office, USSTRATCOM, several Joint Program Offices, and throughout the fleet. The Space Cadre will continue to provide the critical insight and technical expertise necessary to leverage Navy, DOD, and other agency investments in space and optimize warfighting capabilities.

The Navy Space Cadre Advisor is working closely with her Service counterparts to meet both Navy and National Security Space goals and ensure that the Space Cadre is equipped with the proper balance of education and experience. The Naval Postgraduate School (NPS), Space Systems Operations and Space Systems Engineering curricula continue to provide the Navy and other Services graduate education, post-graduate (Engineer) degrees and doctoral degrees. Additionally, NPS offers an online Space Systems Certificate Program in which participants receive instruction on the integration of space capabilities across joint forces and a better understanding of what space effects can realistically provide with reference to networks, sensors and weapons. The Navy sends select Space Cadre members to courses offered by the National Security Space Institute that focus on the application and employment of space capabilities at the tactical and operational levels as a force enhancer and multiplier. We also have a formal Educational Alliance with the Air Force through a memorandum of agreement between NPS and the Air Force Institute of Technology, with the goal of leveraging strengths and eliminating duplication in space education.

SUMMARY

Our mission remains bringing the fight to our enemies. The increasing dependence of our world on the seas, coupled with growing uncertainty of other nations'

ability or desire to ensure access in a future conflict, will continue to drive the need for naval forces and the capability to project decisive joint power by access through the seas, space and cyberspace. Accordingly, we will continue to fight the global war on terror while transforming for the future fight. We will continue to refine our operational concepts and appropriate technology investments to deliver the kind of dominant military power from the sea envisioned in Sea Power 21. We will continue to pursue the operational concepts—such as MDA—even as we invest in technology and systems to enable naval vessels to deliver decisive, effects-based combat power in every tactical and operational dimension. We understand that space capabilities will be critical to our efforts and must be integrated throughout the naval force . . . and we understand that because the future of the Navy is tied to space, we must succeed in growing and maintaining our space cadre. We also look forward to continuing our strong partnership with our Joint Brethren—a relationship that has brought us many successes to date.

Fully integrating the warfighting capabilities that space systems present to our warfighters is one of my priorities. To that end, Navy will continue to be a full joint partner in space.

Senator SESSIONS. Very good.

Next is Lieutenant General Chilton.

STATEMENT OF LT. GEN. KEVIN P. CHILTON, USAF, JOINT FUNCTIONAL COMPONENT COMMANDER FOR SPACE AND GLOBAL STRIKE, U.S. STRATEGIC COMMAND

General CHILTON. Thank you, Mr. Chairman, Senator Nelson, Senator Reed.

It's really a pleasure for me to be here today to represent the men and women of U.S. Strategic Command (STRATCOM) on behalf of General Cartwright, who sends his regrets for not being able to join us today.

My job at STRATCOM is Commander of the Joint Functional Component Command for Space and Global Strike. In addition, I have the privilege of being the Commander of the "Mighty Eighth" Air Force in the United States Air Force. I have the great privilege to serve in those capacities.

Today, though, I'd like to, of course, speak about my role in STRATCOM.

I think it would be hard to argue against the fact that we have great capabilities in space today in the DOD. Indeed, some might argue that we have space superiority today. I believe there's a compelling need for us to maintain and sustain this superiority as we move off into the future. When you consider who our ultimate customers are, this is an easy argument to support, I would suggest, because our customers, ultimately, are the soldiers, sailors, airmen, and marines who rely on these space assets day in and day out to conduct operations in defense of our country.

Our warfighters have grown used to using the assets that space brings to the fight today. They certainly deserve to continue to have those assets available to them, as well as improvements and new and better capabilities.

The soldier in the trench ought to be able to find out and know on demand who is on the other side of the hill that he's going to face. The sailor ought to have insight into what forces are hulled down over the horizon to his force. The airman should know what's going on below that cloud deck below him, and have that information readily available to him. These are the kind of capabilities that we need to continue to enhance and bring forward for our warfighters, in addition to sustaining such capabilities that the

GPS constellation brings today, the ability to precisely locate yourself on the barren wasteland of a desert or in the densest jungle of the world or out on the open sea. Perhaps even more importantly now, after the latest weapons that we've seen developed, to be able to leverage the precision guidance capability that GPS brings to the weapons systems that we can bring to bear on our adversaries.

Our warriors also need voice and data connectivity so that they can receive orders up and down their chain and communicate horizontally within their organizations at the tactical, operational, and strategic levels, so that we can stay one step ahead of our adversaries in the battlefield of the future.

Dr. Sega gave a great example of how we can understand, observe, and predict weather with our space assets, a capability that can really have an important and dramatic impact on the outcome of an operation. We need to be able to continue to make sure we have this knowledge and insight so that we can use weather to our advantage in the future, and to the disadvantage of our adversary.

Of course, we've grown accustomed to missile warning, not only at the strategic level for our Nation, but at the tactical level, as well, in theater. Our troops deserve to have that capability provided to them, so that they know exactly what protective measures to take when they come under attack.

Our space assets today remain a key enabler for many of these capabilities; in some cases, the only provider of these capabilities to our warriors.

A good military person always tries to put on the hat of the adversary and reflect back on how you would fight that particular individual when you go to combat. If I were to put on the hat of adversary and look at the U.S. dependence on space and how accustomed we have grown to using it, I would also be tempted to look at that as a vulnerability that I may want to try to exploit to help level the playing field in any future conflict. Indeed, it is not only our warriors who would be affected by attacks on our space infrastructure, but the economy of the United States and the quality of life that we've come to enjoy just day in and day out in our daily lives, from GPS to satellite communications and more.

So, our adversaries, I suggest, understand our dependence. From that perspective, I think it's important that we pay attention to defense—not only increasing the capabilities we have, but defending those capabilities now and into the future. We have to be equipped to assure our allies and to deter and defeat our adversaries, should they decide to go after our space capabilities.

The QDR gave us a good look into the future of what our needs might be when it said future forces will place a premium on capabilities that are responsive and survivable. So, I'd like to talk a little bit about responsive space operations.

Now, Senator Nelson, I know your background, having flown on the space shuttle. It's a marvelous vehicle that can do incredible things even today that are hard to imagine. But to call it responsive in getting off the launch pad, I think you would probably agree that responsive probably is not the right adjective for it, given the number of times that you scrubbed, getting ready to fly. This fact doesn't diminish the importance of that capability.

On the other hand, what the military would like to see, and what we'd like to have as a capability in the future, is a truly responsive capability to put assets into space, something that takes hours, not months, to launch; a satellite that can be put up quickly and then made to operate quickly. There's several elements of this concept. We have to address how we launch satellites. We have to address the booster to make sure it's responsive, as well. We have to address satellite design to make sure once it's up on orbit it doesn't take 3 months to check out, but just hours or minutes. Then we have to address the command and control of those constellations if they're truly going to be responsive, so that they can serve our purposes when they're up.

STRATCOM is a big advocate for what we call responsive space operations, or you may have heard it called operationally responsive space, or several other acronyms, but all are names for this capability to put up small constellations of satellites quickly, in an affordable manner.

To what purpose? A couple of scenarios I can think of. One might be where there are activities that we are suspicious of going on over what we would call "denied airspace" today, deep inside a country where we could not bring to bear air-breathing assets to focus intelligence, surveillance, or reconnaissance (ISR) on. It may be that we want to increase the amount of intelligence we're gathering on that particular area for that particular crisis period or to defuse a potential crisis. This would be a good opportunity to be able to launch a small, relatively inexpensive constellation that could increase our ISR coverage in that particular area of concern.

Also, with the global war we're fighting today against terrorists, one cannot predict where next the crisis will develop around the globe. In this regard, there could be a scenario where multiple crises develop that could put stress on our current capability to surveil and keep track of those crises. Again, another scenario where perhaps a responsive space capability to supplement or augment our current capabilities, whether they be in surveillance or communications, could be advantageous to the warfighter.

Shifting back here to the concept of space defense, and XSS-11, which Dr. Sega brought up, responsive space capability might be good for the case where one of our satellites on orbit has something go wrong with it, and we don't know what caused the problem. Having the capability to quickly launch a small satellite that could go up and surveil our own satellites to determine if that damage to the satellite or the reason it became inoperative, was caused by a systems failure, a natural failure, or by the actions of an adversary, could be very important in defusing a potential crisis situation in the future.

The capabilities that we have today, and the ones that we see on the drawing board in the future that Dr. Sega has painted here on acquisition, make these exciting times to be involved in the space business. The challenges we have in front of us, too, also make it a very exciting time for me to be a part of this. I'm very appreciative of that opportunity.

I look forward to our working together to meet both these challenges and explore new opportunities as we move forward. Mr. Chairman, I thank you very much for giving me the opportunity to

make these opening remarks, and I look forward to answering your questions.

[The prepared statement of General Chilton follows:]

PREPARED STATEMENT BY LT. GEN. KEVIN P. CHILTON, USAF

Mr. Chairman, Senator Nelson, and members of the subcommittee: Thank you for this opportunity to review U.S. Strategic Command's (USSTRATCOM) and specifically Joint Functional Component Commander Space and Global Strike's (JFCC-S&GS) progress during the past year and to present our plan for the future. 2006 is a year of unprecedented change. Our ultimate goals are driving the pace of change: building strategic advantage, ensuring the security of the American people and strengthening the community of free nations.

ADAPTING TO THE NEW ENVIRONMENT—TRANSFORMING WHILE WE FIGHT

One year ago, we spoke of global interdependence and its impact on how we organize, plan and operate. We emphasized developing strong links between U.S. strategic objectives and regional operations, as our adversaries were employing asymmetric means to strike well beyond the battlefields of Iraq and Afghanistan. We also spoke of our new mission assignments and the steps we had undertaken to transform our command into an agile 21st century organization capable of deterring our adversaries and bringing the full range of global strike, defensive, command and control (C2), and intelligence, surveillance, and reconnaissance (ISR) capabilities to bear against them if necessary. We outlined an enormous transformational effort that had to be accomplished in the context of an ongoing global conflict with active combat operations and without the luxury of an operational pause.

Throughout the last year, the men and women of USSTRATCOM have engaged in that global conflict, often employing means not visible either to the average American or to our adversaries. They met this day-to-day challenge with professionalism and commitment while they were also restructuring our organization to focus our efforts, conserve our resources, and streamline support to other combatant commanders around the world. I come to you today gratified by the progress these fine men and women have made and energized to complete the task before us.

USSTRATCOM TRANSFORMATION VECTORS

The Department of Defense (DOD) budget you enacted for 2006 enabled a string of organizational and operational successes along all of USSTRATCOM's transformation vectors.

We changed the way we are organized and operate. We implemented, and by the end of 2006 will refine, the redistributed and functionally aligned command structure described last year. This new structure is already paying off in terms of decentralized operational employment and increased operational speed.

- Our efforts resulted in four interdependent Joint Functional Component Commands (JFCCs): Intelligence, Surveillance and Reconnaissance (ISR); Network-Warfare (NW); Integrated Missile Defense (IMD) in addition to Space and Global Strike. Day-to-day operational planning and execution of specialized global capabilities now reside at the component level, where commanders are able to maintain focus on their primary mission and not be distracted by staff support activities.
- As Commander, JFCC-S&GS, I am responsible to the Commander, USSTRATCOM to integrate all elements of military power to conduct, plan, present global strike effects and also direct the deliberate planning and execution of assigned space missions. * One of JFCC-S&GS significant accomplishments last year was the establishment of a collaborative Joint Space Operations Center (JSpOC) to deliver select DOD space capability to U.S., Allied, and other national users. When fully operational, JSpOC will provide the full range of DOD space capabilities.

By making this unique organizational transformation we also strengthened our operational relationships with the Defense Intelligence Agency (DIA), Defense Threat Reduction Agency (DTRA), Defense Information Systems Agency (DISA), and National Security Agency (NSA) in order to leverage the tremendous resources and capabilities resident in these organizations. Now we effectively bridge many artificial barriers to communications and information sharing, and bring enhanced combat power to the regional combatant commanders.

We made progress in our drive toward a New Triad of capabilities. The New Triad is comprised of offensive and defensive capabilities enabled by persistent global com-

mand and control (C2), intelligence, an agile planning system, and a responsive defense infrastructure. The New Triad provides improved flexibility in dealing with a wider range of contingencies, while reducing our dependence on nuclear weapons, in order to assure our allies, dissuade competitors, and deter those who plan to harm us, particularly with weapons of mass destruction (WMD). Space is integral to many of the capabilities represented in the New Triad.

Efforts to improve conventional global strike capability focused on generating effects without being hindered by factors of time, distance, basing rights, over-flight considerations or undue risk to American service men and women. Recently the Department:

- Bolstered the number of Joint Direct Attack Munitions (JDAM) in the inventory, providing all weather, precision strike in a smaller weapon footprint.
- Fielded Tactical Tomahawk (TACTCOM) and the Joint Air to Surface Stand-off Missile (JASSM), providing strike weapons that operate from ranges outside enemy point defenses.

During the past year non-kinetic capabilities became an increasingly important tool to deny our adversaries the opportunity to communicate easily or to manipulate information in ways that further their efforts to undermine stability around the world. We seek better non-kinetic capabilities to improve our freedom of action at the lowest level of conflict; to enhance deterrence; and support the sustained ability to use our networks while denying the adversary a similar capability. In this area we:

- Expanded development of the applicable tactics, techniques, and procedures to support use of information and networks—cyberspace—as an environment for integrated exploitation, offensive, and defensive operations.
- Improved integration of non-kinetic effects into operational planning, on a limited basis, in support of forces involved in the global war on terrorism.

The President has committed the United States to sustaining a credible nuclear deterrence capability with the lowest possible number of nuclear weapons consistent with national security. USSTRATCOM's task is to ensure our nuclear force remains ready to meet any contingency while the nuclear stockpile remains safe, secure, and reliable as we prudently achieve the thresholds specified in the Moscow Treaty. To this end we:

- Sustained a safe and reliable nuclear stockpile in cooperation with the national laboratories and the National Nuclear Security Administration (NNSA).
- Took steps to improve the security and safety of the deployed nuclear force.
- Retired the last Peacekeeper Inter-Continental Ballistic Missiles (ICBM) from service.
- Reduced the number of operationally deployed strategic nuclear warheads on the Minuteman III ICBM force.
- Transferred the final ballistic missile submarine scheduled for reconfiguration to carry conventionally armed cruise missiles.

At the heart of the New Triad are the key enablers of command and control, intelligence, and planning. Through these enablers, and our broad array of space capability, we create the agility to respond to a wide range of global challenges. During 2006 we will:

- Evolve the renovated USSTRATCOM Global Operations Center to enhance collaboration among all geographically distributed USSTRATCOM elements—defining the first step toward a Global C2 capability for all New Triad forces.
- Complete preparations for opening the first node in a network of ground entry points designed to serve a nationally distributed ground, air and sea network capable of providing the diverse connectivity requirements of the New Triad and DOD support to a broader national command capability using all elements of national power.
- Capitalize on the longer dwell time of unmanned and unattended sensors to produce greater persistence in global war on terrorism operations.
- Initiate a pilot program to determine essential global strike command and control services with an explicit objective of delivering a distributed, collaborative product. The pilot program will take advantage of the Department's Data Strategy, which calls for visible, accessible and understandable data, and uses Services Oriented Architectures (SOA) to promote flexibility and agility.

- Initiate efforts to transition from a limited space surveillance architecture to a more fully integrated terrestrial and space-based approach to situational awareness.

Improve Space Capabilities

The space mission area creates a decisive strategic advantage for our national security, empowering critical economic as well as defense related activities. Our dependence on space capabilities, coupled with recent significant advances in space operations demonstrated by others, establishes a true imperative to protect our space assets and our freedom of action in space. USSTRATCOM understands the need to stay at least one technology generation ahead of any foreign or commercial space power. We must improve space situational awareness and protection, and ensure unfettered, reliable, and secure access to space. Key initiatives include:

- Improve responsive space access, satellite operations, and other space enabling capabilities such as the space professional cadre.
- Integrate air and space capabilities to deliver combined effects.
- Realign resources to sustain existing space surveillance capabilities.
- Improve warfighter access to the Nation's full spectrum of space capabilities.

USSTRATCOM REQUESTS YOUR SUPPORT TO MEET THE CHALLENGES WE FACE

Over the next 5 years, we must fully transform while remaining engaged in a conflict in which our enemies will use any and all means to achieve their objectives. We believe a more aggressive transformation schedule than envisioned 5 years ago is essential to maintain the strategic advantage needed to deter or defeat those who would do us harm. If we do not accelerate this transition, we will face these adversaries, who attack through asymmetric means, with the blunt weapons of last resort that won the Cold War. That alone will not preserve our future national security. In particular we are requesting your support in the following areas:

Prompt, Precision Conventional Global Strike

Tailored deterrence requires a more complete range of capabilities to address the wide spectrum of challenges that confront us today. While the Department employs expeditionary forces around the globe, it is unlikely we will have forces in every place we need them at the crucial moment when we have an opportunity to stop a WMD-armed threat far from our shores. The United States has the capability to engage with high quality conventional forces around the world, given days or perhaps weeks to respond. But if our general-purpose forces are not in a position to respond rapidly, the need to defeat attacks against the United States may require USSTRATCOM to interdict fleeting targets at global ranges. We have the delivery capability on alert today, but configured only with nuclear weapons. This choice is not credible against many of the extremist adversaries we will face.

We recommend proceeding with development of the responsive, conventional global strike alternative offered by the Conventional Trident Modification (CTM). The President's budget request includes funds for the modification of a number of submarine based Trident Missiles to deliver conventional warheads with precision over thousands of miles in tens of minutes.

Global Command and Control (GC2)

We are now faced with the task of recapitalizing our aging, Nuclear Command and Control (NC2) network, which is a matter of prime importance. Capitalizing on advances in technology, we envision a transition from the single-purpose, stove-piped NC2 network that served us during the Cold War, to a multi-functional, distributed, survivable, and expandable Global Command and Control capability, leveraging the assets and resources of the Global Information Grid and serving the needs of our joint warfighters.

With your support for the President's budget request, we can deliver a resilient air, land, and maritime GC2 capability that will tie together all elements of New Triad power. Fully developed, the GC2 will enable collaboration between, and among, DOD and other government agencies and partners, providing the core of a National Command Capability to meet the broadening array of potential challenges we face as a nation. A true National Command Capability will only be effective with federally mandated standards for data tagging to facilitate enhanced information sharing.

Reliable Replacement Warhead

Finally, if we are to break the cycle of maintaining and refurbishing large numbers of Cold War-era nuclear warheads to guard against uncertainty, we request

your support to ensure a safe, secure, reliable nuclear stockpile, and in the process transform the nuclear weapons enterprise. Discussions over the past year within the executive branch and Congress have increased understanding of the role for nuclear weapons in our current environment, and the value of a responsive defense infrastructure. USSTRATCOM supports the Reliable Replacement Warhead (RRW) as the key to transforming our aging Cold War nuclear weapons stockpile. RRW will enhance our long-term confidence in the stockpile and reduce the need to retain high numbers of hedge weapons while exercising the people, science, technology base, and facilities required for sustaining the nuclear weapons enterprise.

Maintaining the current stockpile of Cold War era weapons is a challenge. If directed, we believe the time is right; the risk is manageable; and the opportunity is at hand to choose weapons that will best serve our future and allow us to further reduce our overall stockpile size, in order to transition to and maintain a smaller but safer, more secure, and more reliable nuclear weapon arsenal.

USSTRATCOM TRANSFORMATIONAL VECTORS BUILDING STRATEGIC ADVANTAGE

USSTRATCOM plays an important role in leading national efforts to send an unambiguous message to our adversaries and friends alike—we will do whatever it takes, for as long as it takes, to ensure the forces of freedom possess a lasting strategic advantage against those who would deny citizens of America and the world the security to govern their own future. We will continue to be aggressive and resourceful in offering our best advice in the pursuit of capabilities needed to meet our national security requirements. With your help we can assure our allies, dissuade unhealthy competition, deter coercive or damaging acts, and above all else, defend our citizens and defeat our enemies. Thank you for your continued support.

Senator SESSIONS. A good presentation, General Chilton.
General Hamel.

STATEMENT OF LT. GEN. MICHAEL A. HAMEL, USAF, COMMANDER, SPACE AND MISSILE SYSTEMS CENTER, AIR FORCE SPACE COMMAND

General HAMEL. Thank you very much, Mr. Chairman, Senator Nelson, Senator Reed. It is a true privilege for me to be able to appear before this committee today. I am pleased to be able to represent the Air Force's Space and Missile Systems Center. I would like to say that we have a critically important mission, a very proud heritage, and a highly-skilled workforce of some 4,500 people that are performing our space acquisition mission.

Space has evolved since the mid-1950s as a fledgling research effort to the point today where it has been pointed out that we are an indispensable element of our Nation's joint warfighting capabilities. I'm privileged to serve as the Commander of the Space and Missile Center, as well as the Air Force's Program Executive Officer for Space, and, in that capacity, have responsibility for developing, acquiring, fielding, and supporting a broad set of satellites, launch vehicles, missile systems, radars, ground systems, and user equipment for joint force operators.

Now, we are very proud of the accomplishments over the years which we have been able to achieve, including, most recently, having set the longest successful string of successive launch missions in the history of the military space business. We have the most robust set of satellites on orbit, performing missions, and, as you pointed out here, they are truly integrated into every aspect of air, land, and maritime warfare on a global basis. We also have a fantastic set of products that are in the development pipeline.

We also recognize that we have problems. I would like to, today, be able to reassure you that we are addressing these problems with full focus and determination.

If I might, just in a minute here, give you an idea of the kind of things that we're doing to get acquisition on track. Our overarching strategy, as Dr. Sega said, is really based upon the idea of getting back to basics. We are reestablishing structure and discipline and rigor by applying strong systems engineering principles across all of our programs and processes. We're ensuring that we have testing built into the systems from very early on, that we have mission assurance processes that are to be applied from the very beginning of a program. Likewise, we understand that it's not just about the technical aspects of the program, but it's also about how it is we manage costs and schedule and risk throughout. In that vein, we are actually improving our cost-estimating capabilities so we have higher confidence, when we propose programs, that, indeed, we can deliver on our promises.

Another focus of our "back to basics" process is redefining and renewing partnerships across the space community. That means developers such as the organization that I am in charge of, and our operators that are represented by General Chilton and other users out there, soldiers, sailors, airmen, and marines across the joint force operations, and industry, whom we depend upon to actually produce the systems that will be put into operations. As I refer to it, space is a team sport, and it requires all players play with high efficiency and effectiveness to deliver a winning score.

Another priority is to make sure that we get an absolutely top quality acquisition workforce. People are our most important asset. We are going about a revitalization of the workforce that includes military, civilians, federally-funded R&D centers, as well as working with industry to ensure that we have the right skill sets. We're trying to attract, retain, train, educate, and mentor a whole new generation of space acquisition professionals to ensure that, indeed, we're up to the task. As I like to say it, we know what the recipe is, but we also have to make sure that we have the right cooks in order to be able to produce the products that we expect.

Another thing we're doing at the Space and Missile Center is presenting a horizontal integration capability. What I mean by that is, is that instead of having individual stovepipe programs, we are trying to build in cross-program capabilities and engineering architectures, program management, acquisition strategies in contracting, so that we learn across the many programs and actually apply the best practices, and, likewise, reach to other organizations and agencies, such as the National Reconnaissance Office (NRO), as well as National Aeronautics and Space Administration (NASA) and others, to really apply best practices across all of our programs so that we are, indeed, a learning organization.

Dr. Sega talked extensively about the incremental block development approach, and we are applying that to programs across the board. He spoke about the TSAT, but we are, likewise, applying this to the GPS program to space-based space surveillance and other programs to ensure that we take this very measured, deliberate approach in developing and fielding capabilities.

I'll tell you, sir, that it's going to take time to achieve full results, but we really are making significant progress in rebuilding our acquisition and development capabilities, getting our troubled programs on track, and ensuring that new programs that we're pur-

suings are going to have the full rigor and discipline to be able to deliver the capabilities that we promise from the very beginning.

We appreciate very much the support we have from Congress for the programs, as well as the budgets we're requesting, because we believe that these are essential for ensuring that our Nation and its military forces will retain their unique advantages in the battlefield from space.

I appreciate the opportunity for a few opening remarks, and will submit my formal statement for the record, sir.

[The prepared statement of General Hamel follows:]

PREPARED STATEMENT BY LT. GEN. MICHAEL A. HAMEL, USAF

INTRODUCTION

Mr. Chairman and distinguished members of the subcommittee, it's a great honor to appear before you today to represent the Air Force (AF) Space and Missile Systems Center (SMC) and discuss the budgets and progress of AF space acquisition programs. SMC has a critically important mission, a proud heritage and a highly-skilled force of some 4,500 space acquisition professionals. Our roots date back to 1954 when the U.S. Air Force activated the Western Development Division under the leadership of Brigadier General Bernard Schriever to develop intercontinental ballistic missiles (ICBMs) for the Nation. Ultimately, those early innovations laid the foundation for our Nation's entire military space program. Now, more than 50 years later, we are leading the development and acquisition of critical military space capabilities for the 21st century. The space frontier is critical to our Nation's warfighters and SMC delivers the operational capabilities to control and exploit the ultimate high ground of space.

Space has evolved since the mid-1950s from a fledgling research organization to an indispensable element of our Nation's joint warfighting capabilities. I am privileged to serve as the Commander of SMC and the AF Program Executive Officer (PEO) for Space and am responsible for developing, acquiring, fielding and supporting a comprehensive set of satellites, launch vehicles, missiles, radars, ground systems, and user equipment. SMC has been the premier space development and acquisition organization within the Department of Defense (DOD), and provides the majority of space operational capabilities for the AF and DOD.

SMC TODAY

Today, SMC is simultaneously supporting and sustaining current operational capabilities in-orbit, developing the next generation of space and ground systems, and demonstrating advanced systems and technologies that will transform future military operations. The progress and accomplishments we've achieved in the recent past are most impressive. In the launch business, we have successfully transitioned from our legacy launch systems to the new, more flexible family of reliable launch vehicles. The last of the Titan launch vehicles thundered into the history books in October 2005 setting the new record for consecutive major launch successes at 43 in a row. The new evolved, expendable launch vehicles—Atlas V and Delta IV—are proving their value with every new launch—the most recent being National Aeronautics and Space Administration's (NASA) New Horizons Pluto mission to space on 19 January 2006.

Our satellite constellations are capable and robust, performing well beyond their designs. For example, our defense weather satellites were designed for 3 years of life, yet Flight Vehicle 13 just reached 11 years of on-orbit service. These systems continue to provide operational service which we've come to depend on, and sometimes take for granted.

Although the Space Based Infrared Systems (SBIS) program has experienced significant difficulties, we have recently delivered two sensors to fly on host satellite platforms and are well along in testing of the geostationary orbit sensor and satellite bus. This system promises to provide much improved capabilities to detect, warn and defend against ballistic missiles, as well as provide new battlefield and intelligence information. We're looking forward to launching this very important system within a few years.

The Global Positioning Satellite (GPS) constellation has transformed military operations, as well as civil transportation, banking, communications, energy and many other aspects of modern life. Last fall we launched the first modernized GPS satellite, which provides important new signals and services for both military and civil

users, and have improved accuracy to users by some 15 percent. While we continue to improve on orbit capabilities and user services, the GPS constellation is aging. We are aggressively working to develop and deploy new GPSIIF satellites and to pursue the next generation system, GPSIII.

We are developing a full array of advanced satellite communications systems that will provide wideband, protected, broadcast, tactical and data relay capabilities for joint expeditionary operations. Modern military operations requires massive quantities of information and communications across the battlefield and around the globe—space based communications systems provide the rapid, responsive means to link commanders, combat forces and information across the battlespace. We have a number of developmental products in the pipeline. The Advanced Extremely High Frequency satellite, the Wideband Gapfiller Satellite and the Transformational Satellite program will offer combatant commanders options unthinkable only a few years before.

In addition to individual programs, SMC is also realigning its organization and processes to improve program development and execution across the space enterprise. We are reinstituting our space developmental planning organization to better refine concepts, technologies and future programs. We are restoring our systems engineering, architectures, program management, cost estimating, test and evaluation and program control capabilities across the entire center. These efforts will ensure better understanding of the costs, risks, and performance of new concepts and technologies before committing to major acquisition programs and improve execution of system developments and procurements.

We're proud of our accomplishments but also recognize we have problems, which we are addressing with full focus and determination. We've experienced cost overruns and schedule slips in too many of our space programs, which has delayed delivery of operational capability to the Warfighter, undermined our credibility, and reduced confidence in the space development community. There are many underlying causes for the erosion of our space acquisition performance, which have been identified in various DOD studies and reviews and there is clear consensus on steps we need to take to restore acquisition performance. We know the "recipe for success" in space acquisition and have a comprehensive plan to get space acquisition back on track.

BACK TO BASICS

Our overarching strategy to restore acquisition performance is to get "back-to-basics." We're reestablishing structure and discipline by applying strong systems engineering practices in the early stages of each program; by addressing mission assurance from the beginning; and by thorough testing of components and systems early and often. We are reestablishing standards and specifications in our contracts to insure common language and expectation with industry. A rigorous mission assurance process is being applied to all launch and satellite programs to insure strict adherence to design, parts, testing and quality control standards from system development through on-orbit checkout.

Cost estimating is a critical element of the space acquisition process. We're working hard to improve schedule planning, cost estimating and risk assessment on all programs to better forecast how many taxpayer dollars will be needed for each mission. It is critical that we provide lawmakers with accurate estimates to increase confidence when making decisions on these systems. We must better understand cost, schedule, requirements and risk trades if we are to make informed program decision and better assure mission success. We're also restoring strong program control functions and expertise within our systems program offices. This will allow us to more effectively plan, monitor and assess contractors' cost, schedule and technical performance in individual programs and across families of systems. The program control function is critical to maintaining a true picture of program status and baseline control.

Another focus area of SMCs "back to basics" strategy is renewing and redefining partnerships across the space enterprise—developers, operators, users and industry. Space is a "team sport" and every member of the team must perform to their highest level if we are to be successful. The stakes are high and the environment is unforgiving—we do not get two chances to do it right. We have established a "benchmarking" process with all our major contractors to provide candid two-way feedback to foster "best practices" and continuous improvement. The space enterprise is founded on a healthy set of checks and balances that are focused on mission success. Personal initiative and accountability are essential at all levels since a single lapse in attention to detail can spell the difference between success and total

failure. Effective teamwork between government and industry—prime contractors, subcontractors and suppliers—is essential. We can't succeed without each other.

SMC is increasingly focused on our customers—space operators, joint warfighters and civil partners. We must understand their needs in an unpredictable world, filled with uncertain threats and rapidly changing situations. SMC strives to meet their needs with responsive development processes and the timely fielding of capabilities. We increase our ability to respond by partnering with the Air Force Research Lab, Air Force Materiel Command, U.S. Strategic Command (STRATCOM), and other Services and agencies to ensure we provide for their needs technically and operationally. The space community will achieve its full potential only if we reduce fragmentation and conflicting agendas. As the use and dependence on space grows across the military, it is imperative that the national security space community work in a more coordinated, collaborative, and interdependent fashion.

Last month, Under Secretary of the Air Force, Dr. Ronald Sega, and SMC co-sponsored a National Security Space Program Managers' Conference to expand teamwork and lines of communication between program managers across the National security space community—NRO, MDA, Electronics Systems Center (AFMC) and Navy and Army space organizations. This collaboration helps share experiences and “best practices”, provides more problem-solving resources, and promotes cross-flow of experience and workforce. Instead of competing for valuable resources, such as dollars and personnel, we leverage what we have across the space enterprise.

Reductions in the space acquisition workforce of the past decade and the loss of critical skills have had direct and significant impacts on mission success and program performance. A top priority for the AF and SMC is to rebuild the space acquisition workforce. We depend on a mix of military, civilian, federally-funded research and development contractors (FFRDC) and other support contractors to manage the complex developments and contracts. SMC has aggressive efforts underway to improve recruiting, retention, education, training, and mentoring of our workforce. Through partnerships with the educational, industrial, and governmental institutions, we are working to increase the cadre of highly talented and experienced space acquisition people to meet the needs across the community. SMC is working to attract more officers and civilians with technical degrees and higher levels of experience. We have established educational programs with universities, military institutes (such as the Air Force Institute of Technology (AFIT) and the Naval Postgraduate School (NPS)) and defense contractors to enhance understanding of system engineering and program management. Assignment length for military personnel has been extended from 3 to 4 years to insure they gain increased depth of experience, and that we improve continuity and accountability in programs. We've also created opportunities for leadership development, assigning more civilians as deputy program managers, sending greater numbers to Squadron Officers School, Air Command and Staff College and the Air War College.

We depend upon the Aerospace Corporation and other FFRDCs to provide deep technical and engineering expertise and continuity in our programs. We also augment our workforce with other systems engineering and technical assistance (SETA) contractors. We cannot do our job without these critical partners. Continued tight budgets will likely increase pressures to limit or reduce support contracts—we will work to be more efficient, but it is essential that we maintain critical skills if we are to effectively manage the billions of dollars in development programs.

Another priority for SMC is to improve horizontal integration across our programs and the broader space enterprise. This includes organizing to enhance engineering and architectural standards and processes; implement best business practices for contracting, incentives, and budgeting; improve development planning, modeling and analysis and technology planning. Horizontal integration of expertise across the space acquisition enterprise creates efficiencies of resources and mission accomplishment using “best practices” and world-class processes across the portfolio. Understanding mission requirements and common architectural solutions will allow individual program offices to share experiences, resources, and solutions based on common systems engineering principles. The payoff of this horizontal integration is that the systems SMC delivers to space operators and joint commanders will enable more integrated and responsive air, land, maritime, space and cyberspace operations.

Another key to improving acquisition performance in space programs is the AF's effort to implement a new business model for space acquisition. We are establishing and applying a block or incremental approach to developing, acquiring and fielding space systems across the Air Force. The objective of this approach is to reduce program cycle time and redistribute risk across a program's life cycle, from early phases of technology maturation through system development and operational system procurement. We'll more consciously allocate risk across different phases in the life cycle of programs. The highest risk will be in the earliest stage of science and

technology—production programs will be based on mature technology for the lowest risk. We will insure more mature technologies, more stable requirements, and more discipline in end-to-end systems design. The expectation is that cycle times will be reduced and that we'll be able to maintain cost and schedule with higher confidence, and produce more effective capabilities sooner by synchronizing science and technology, technology development, systems development and demonstration, and systems production. The Global Positioning System, Space Based Radar, Space Based Space Surveillance System, and Transformational Communication Satellite programs are pioneering the process now.

CONCLUSION

Space capabilities have become an integrated and indispensable element in virtually all joint military operations. They provide the means to plan and execute operations across the globe, and enable unprecedented speed, precision and effectiveness. Today the U.S. enjoys an asymmetric military and national security advantage from these cutting edge systems. Further, space is increasingly important in civil and commercial applications and serves as an engine of economic and technological leadership. Maintaining our military advantage demands that we continue to develop and field the most advanced and affordable space capabilities possible. We have experienced many problems in space acquisition in the Air Force and across the government and industry. We know the root causes of these problems and have a comprehensive, "back to basics" strategy for restoring our space acquisition performance. It will take time to achieve full results, but we are making significant progress in rebuilding our capabilities, getting troubled programs on track and insuring important new programs are set on a solid foundation from the beginning. We appreciate the support from Congress for the programs and budgets that are essential to insuring our Nation and its military forces retain the unique advantages we derive from space. SMC and its partners in government and industry are committed to making space acquisition the model across the DOD and to provide our military forces the finest space capabilities possible.

Senator SESSIONS. Thank you, we'll make those a part of the record. Ms. Chaplain, GAO.

Ms. CHAPLAIN. GAO.

STATEMENT OF CRISTINA T. CHAPLAIN, ACTING DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT TEAM, GOVERNMENT ACCOUNTABILITY OFFICE

Ms. CHAPLAIN. Chairman Sessions, Senator Nelson, and Senator Reed, thank you for inviting me to participate in this afternoon's hearing on DOD space acquisitions. Today, I'll be discussing why we need to improve DOD's return on investment in space, and how we can do so.

DOD space systems play an increasingly critical role in supporting military operations and our economy, but the programs focused on acquiring these systems are experiencing problems that are driving up costs by billions of dollars, stretching schedules by years, and increasing performance risks. Outcomes have been so disappointing in some cases that DOD has had to go back to the drawing board to consider new ways to achieve the same capability. It is in such a position today with its new missile detection and its weather monitoring satellite programs.

Taken together, acquisition problems are having a dramatic effect on DOD's space investment portfolio. Over the next 5 years, there'll be about \$12 billion less available for new systems, as well as for the discovery of promising new technologies, because of cost growth.

While DOD is pushing to start new highly ambitious programs, such as the TSAT or Space Radar, broader analysis of the Nation's

fiscal future indicate that spending for weapons systems may need to be reduced, rather than increased, to address growing deficits.

This investment picture makes it critical to address root problems that make space programs unexecutable. These include competition for funding, which encourages low-cost estimating, optimistic scheduling, and overpromising, and also a tendency to start programs too early—that is, before there is assurance that design capabilities can be achieved within available resources and time constraints.

Our previous recommendations have focused on addressing these and other root causes, but DOD has chosen not to fully implement them on large acquisitions. Recently, however, with new leadership, the Air Force has embraced adopting the best practices we have recommended. In Dr. Sega's view, they represent a common-sense approach that was followed in much earlier space efforts.

The Air Force has also recently taken steps to put its TSAT program on a more executable track. It has reduced its expectations in the level of sophistication of its first two satellites so that it can meet schedule goals. It is also holding off on entering formal acquisition of the program until critical technologies are proven.

These are good steps when looking at TSAT as an individual program. It is important, however, that the Air Force ensure warfighters accept lower capability and that it makes sense to pursue the current approach versus the alternative of buying additional communications satellites that are further along in production.

On the broader scale, there are steps that can be taken to facilitate the Air Force's "back to basic" approach for all space programs. First, the Air Force, with others, can develop an overall investment strategy that identifies funding priorities. This will help balance investments between legacy programs and new programs, as well as between science and technology activities and acquisition activities. Optimally, DOD would do this for its entire weapons system investment portfolio so that it can assure that all new programs are affordable.

Second, the Air Force can change policies to adopt best practices. For example, the Air Force's space acquisition policy could be further revised to ensure that a true evolutionary approach is being pursued, and that blocks, or increments, will include only technologies that have been sufficiently matured.

Other steps, which range from enhancing workforce capacity to increasing opportunities for testing new technologies in space, are detailed in my written statement.

In closing, implementing best practices for space acquisitions will not be an easy undertaking. DOD, as a whole, still operates in an environment that encourages competition for funding, and, thus, behaviors that have been detrimental to meeting cost and schedule goals. Moreover, the changes being proposed will require significant shifts in thinking about how space systems should be developed and changes in incentives.

Lastly, while it may be easier to focus on bringing change program by program, it is important to ensure that change occur within the context of the entire space investment portfolio. This will require tough tradeoff decisions, but it'll ensure that the right mix

of programs are being pursued, and that user needs can be met in a timely and cost-effective fashion.

This concludes my statement. I respectfully request that my written statement be submitted for the record, and I'll be happy to answer any questions you have.

[The prepared statement of Ms. Chaplain follows:]

PREPARED STATEMENT BY CRISTINA T. CHAPLAIN

Mr. Chairman and members of the subcommittee: I am pleased to be here today to discuss the Department of Defense's (DOD) space acquisitions. Each year, DOD spends billions to acquire space-based capabilities to support current military and other government operations as well as to enable DOD to transform the way it collects and disseminates information, gathers data on its adversaries, and attacks targets. In fiscal year 2007 alone, DOD expects to spend almost \$20 billion to develop and procure satellites and other space systems, including nearly \$7 billion on the major space systems.¹ Despite its growing investment in space, however, DOD's space system acquisitions have experienced problems over the past several decades that have driven up costs by hundreds of millions, even billions of dollars, stretched schedules by years, and increased performance risks. In some cases, capabilities have not been delivered to the warfighter after decades of development.

As a result of these problems, DOD is now contending with important trade-off decisions such as whether to continue investing in long beleaguered efforts or undertake more promising alternatives. At the same time, leadership now recognizes the need to substantially change DOD's current space acquisition approach and the value of adopting practices that will lay a better foundation for program execution. Within this context, I will discuss our findings on space acquisition problems, recent steps DOD has taken in an effort to address these problems, and the changes that still need to occur if DOD is to break the cycle of acquisition problems.

SPACE ACQUISITION PROBLEMS PERSIST

The majority of satellite programs we have reviewed over the past 2 decades experienced problems during their acquisition that drove up costs and schedules and increased technical risks. Several programs were restructured by DOD in the face of delays and cost growth. At times, cost growth has come close to or exceeded 100 percent, causing DOD to nearly double its investment in face of technical and other problems without realizing a better return on its investment. Along with the cost increases, many programs are experiencing significant schedule delays—as much as 6 years—postponing delivery of promised capabilities to the warfighter.

Outcomes have been so disappointing in some cases that DOD has had to go back to the drawing board to consider new ways to achieve the same capability. It is in such a position today, with its Space-based Infrared System (SBIRS)-High program and possibly its National Polar-orbiting Operational Environmental Satellite System (NPOESS) program, both of which have been mired in expanding cost and schedule setbacks.

More specifically, DOD's investment in SBIRS-High, a critical missile warning system, has been pushed to over \$10.5 billion from the initial \$4.1 billion estimate made over 9 years earlier. This 160-percent increase in estimated costs triggered a fourth Nunn-McCurdy² breach (see 10 U.S.C. 2433), requiring a review by the Secretary of Defense and a report to Congress, and resulted in the program being restructured for a third time, in late 2005. With costs and timelines spiraling out of control, DOD reduced the number of satellites it plans to procure—pushing the average per unit procurement cost up to 224-percent above 2002 baseline costs—and is now pursuing an alternative to SBIRS-High while it continues with the scaled back program.

Initial cost and schedule estimates for NPOESS—a new satellite constellation intended to replace existing weather and environmental monitoring satellites—have

¹ Estimates of fiscal year 2007 spending are based on DOD's Fiscal Year 2006 Future Year Defense Program (FYDP) plan. The fiscal year 2007 FYDP plan was not available to us at the time of this testimony.

² 10 U.S.C. § 2433. This oversight mechanism originated with an amendment to the Department of Defense Authorization Act, 1982. It was made permanent in the following year's authorization act and has been amended several times. Generally, the law requires DOD to review programs and report to Congress whenever cost growth reaches specified thresholds. The statute is commonly known as the Nunn-McCurdy amendment based on the names of the sponsors of the original legislation.

also proven unreliable. NPOESS is managed by a tri-agency Integrated Program Office consisting of DOD, the National Oceanic and Atmospheric Administration, and National Aeronautics and Space Administration. In January 2006, the program reported a Nunn-McCurdy unit cost breach, at the 25-percent threshold, due to continuing technical problems, including problems with the development of key sensors. Specifically, in early 2005, DOD learned that a subcontractor could not meet cost and schedule targets due to significant technical issues on an imaging sensor known as the visible/infrared imager radiometer suite (VIIRS) sensor—including problems with the cryoradiator, excessive vibration of sensor parts, and errors in the sensor's solar calibration. These technical problems were further complicated by subcontractor management problems. To address these issues, DOD provided additional funds for VIIRS, capped development funding for other critical technologies, and revised its schedule to keep the program moving forward. We also reported that based on our own analysis of contractor trends, the program will most likely overrun costs by \$1.4 billion.³ Given the challenges currently facing the program, the scheduled first launch date slipped 17 months to September 2010.

Another recent example of problems is evident in the Advanced Extremely High Frequency (AEHF) program. We reported in the past that this program experienced cost increases due to requirements changes, inadequate contract strategies, and funding shortfalls. We also reported that DOD had to cut back its planned purchase of satellites from five to three as a result. The outcome has been an 84-percent unit cost increase—each AEHF satellite is now estimated to cost about \$2.1 billion. More recently, we reported that scheduling delays and the late delivery of cryptographic equipment have culminated into nearly a 3-year delay in the launch of the first satellite and that the program still faces schedule risk due to the continued concurrent development of two critical path items managed and developed outside the program.

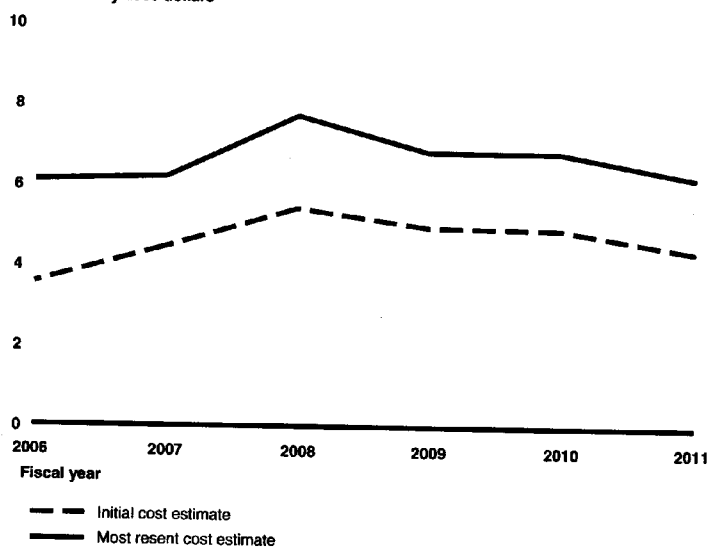
Acquisition problems have not been limited to the development of home-grown systems. DOD's purchase of an ostensible commercial satellite for the use of communications, the Wideband Gapfiller Satellite (WGS), is experiencing about a 70-percent cost growth, due in part to the problems a subcontractor was experiencing in assembling the satellites. Improperly installed fasteners on the satellites' subcomponents have resulted in rework on the first satellite and extensive inspections of all three satellites currently being fabricated. The cost for WGS has increased about \$746.3 million but DOD estimates that about \$276.2 million of this amount is largely due to cost growth associated with a production gap between satellites three and four. The launch of the first satellite has now been delayed for over 3 years and is currently scheduled for June 2007. The delay will increase program costs and add at least 22 months to the time it takes to obtain an initial operational capability from the system.

Figure 1 shows that, overall for fiscal years 2006 through 2011, estimated costs for DOD's major space acquisition programs have increased a total of about \$12.2 billion—or nearly 44-percent in total—above initial estimates. Figure 2 breaks out this trend among key major space acquisitions.

³ GAO, *Defense Acquisitions: Assessment of Selected Major Weapon Programs*, GAO-06-391 (Washington, DC: March 31, 2006).

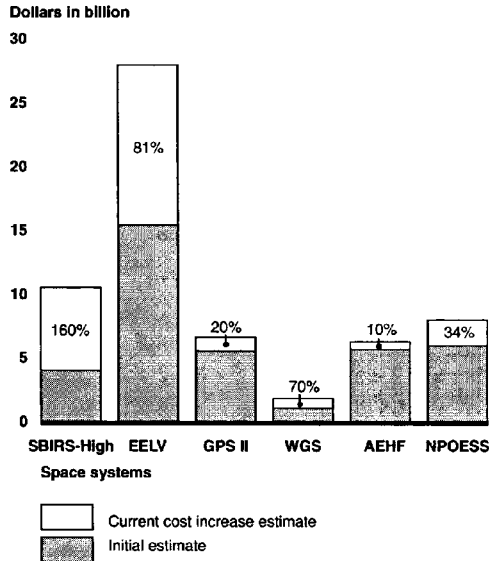
Figure 1: Comparison between Original Cost Estimates and Current Cost Estimates for Major Space Acquisition Programs* for Fiscal Years 2006 through 2011

In billions in fy 2006 dollars



Source: GAO analysis of DOD data.

*Includes: AEHF, Evolved Expendable Launch Vehicle, Global Broadcast Service, Global Positioning System II, Mobile User Objective System, NPOESS, SBIRS High, TSAT, and WGS.

Figure 2: Cost Growth in Selected Current Space Programs in Base Year Dollars

Source: GAO analysis of DOD data.

Notes: Original AEHF cost was for five satellites; the latest estimate for AEHF is for three satellites. SBIRS High data is through the latest Selected Acquisition Report, dated September 2005.

As both figures illustrate, cost increases have had a dramatic impact on DOD's overall space portfolio. To cover the added costs of poorly performing programs, DOD has shifted scarce resources away from other programs, creating a cascade of cost and schedule inefficiencies. For example, to fund other space programs, DOD has had to push off the start of a new version of the Global Positioning System (GPS), which has forced costs to increase for the current version under development. Meanwhile, DOD is also contending with cost increases within its Evolved Expendable Launch Vehicle (EELV) program. These are largely due to misjudgments about the extent to which DOD could rely on commercial demand to leverage its investment. Nevertheless, the resulting \$12.6 billion increase has added pressures to make tradeoffs.

At the same time that DOD is juggling resources on existing programs, it is undertaking two new efforts—the Transformational Satellite Communications System (TSAT) program and Space Radar program—which are expected to be among the most ambitious, expensive, and complex space systems ever. Moreover, DOD is relying heavily on their planned capabilities to fundamentally enable DOD to transform how military operations are conducted. In fact, many other weapon systems will be interfaced with these satellites and highly dependent on them for their own success. Together, these systems have been preliminarily estimated to cost about \$40 billion. While DOD is planning to undertake the new systems, broader analyses of the Nation's fiscal future indicate that spending for weapon systems may need to be reduced, rather than increased, to address growing deficits.

UNDERLYING CAUSES OF ACQUISITION PROBLEMS

Our reviews have identified a number of causes behind the problems just described, but several consistently stand out. First, on a broad scale, DOD starts more weapon programs than it can afford, creating a competition for funding which encourages low cost estimating, optimistic scheduling, over promising, suppressing bad news, and for space programs, forsaking the opportunity to identify and assess potentially better alternatives. Programs focus on advocacy at the expense of realism and sound management. Invariably, with too many programs in its portfolio, DOD

and even Congress are forced to continually shift funds to and from programs—often undermining well-performing programs to pay for poorly performing ones.

Second, DOD starts its space programs too early, that is, before it has assurance that the capabilities it is pursuing can be achieved within available resources and time constraints. This tendency is caused largely by the funding process, since acquisition programs attract more dollars than efforts concentrating solely on proving out technologies. Nevertheless, when DOD chooses to extend technology invention into acquisition, programs experience technical problems that have reverberating effects and require large amounts of time and money to fix. When programs have a large number of interdependencies, even minor “glitches” can cause disruptions.

A companion problem for all weapon systems is that DOD allows new requirements to be added well into the acquisition phase. Many times, these significantly stretch the technology challenges (and consequently, budgets) the program is already facing. This was particularly evident in SBIRS-High up until 2004. While experiences would caution DOD not to pile on new requirements, customers often demand them fearing there may not be another chance to get new capabilities since programs can take a decade or longer to complete.

Third, space programs have historically attempted to satisfy all requirements in a single step, regardless of the design challenge or the maturity of the technologies to achieve the full capability. Increasingly, DOD has preferred to make fewer, but heavier, larger, and complex “Battlestar Galactica-like” satellites, that perform a multitude of missions rather than larger constellations of smaller, less complex satellites that gradually increase in sophistication. This has stretched technology challenges beyond the capability of many potential contractors and vastly increased the complexities related to software—a problem that affected SBIRS-High and AEHF, for example.

Our reviews have identified additional factors that contribute to space acquisition problems, though less directly affecting cost and schedule problems we have reported on. For example, consolidations within defense supplier base for space programs have made it more difficult for DOD to incorporate competition into acquisition strategies. Since 1985, there were at least ten fully competent prime contractors competing for the large programs and a number that could compete for sub-contracts. Arguably today, there are only two contractors that could handle DOD’s most complex space programs. DOD has exacerbated this problem by not seeking opportunities to restructure its acquisitions to maximize competition, particularly for the small suppliers who have a high potential to introduce novel solutions and innovations into space acquisitions. In the 1990s, DOD also structured contracts in a way that reduced oversight and shifted key decisionmaking responsibility onto contractors. DOD later found that this approach—known as Total System Performance Responsibility (TSPR)—magnified problems related to requirements creep and poor contractor performance.

Another factor contributing to problems is the diverse array of officials and organizations involved with a space program, which has made it even more difficult to pare back and control requirements. The Space Radar system, for example, is expected to play a major role in transforming military as well as intelligence-collecting operations and other critical governmental functions, such as homeland security. As a result, its constituency includes combatant commanders, all of the military services, intelligence agencies, and the Department of Homeland Security (DHS). The GPS not only serves the military, it provides critical services to civilian users, the transportation sector, the information technology sector, among many other industries.

In addition, short tenures for top leadership and program managers within the Air Force and the Office of the Secretary of Defense (OSD) has lessened the sense of accountability for acquisition problems and further encouraged a short-term view of success, according to officials we have interviewed. Though still in a pre-acquisition phase, TSAT and Space Radar have already had one program director each. The SBIRS-High program, meanwhile, has seen at least three program directors. At the highest levels of leadership, for many years, DOD did not invest responsibilities for its space activities in any one individual—leaving no one in charge of establishing an integrated vision for space or of mediating between competing demands. In 1994, it established such a position within the OSD, but dissolved this position in 1998. In 2002, DOD established a space leadership position within the Under Secretary position in the Air Force, combined it with the directorship of the National Reconnaissance Office in order to better integrate DOD and intelligence space activities, and allowed the Under Secretary to have milestone decision authority for major space systems acquisitions. After the first Under Secretary of the Air Force in charge of space retired in 2005, DOD split these responsibilities and temporarily reclaimed milestone decision authority for all major space programs. Changes in

leadership and reorganizations are common across DOD, but again, they make it more difficult to enforce accountability and maintain the right levels of support for acquisition programs.

Lastly, there are capacity shortfalls that have constrained DOD's ability to optimize and oversee its space programs. These include: shortages in the pipeline of scientists and engineers, shortages of experts in systems and software engineering, and uneven levels of experience among program managers. Contractors are also facing workforce pressures similar to those experienced by the government, that is, not enough technical expertise to develop complex space systems. In addition, we have reported that there is a lack of low-cost launch opportunities, which are needed to increase the level of experimental testing in space.

DOD HAS EXPRESSED ITS COMMITMENT TO IMPROVE ITS APPROACH TO SPACE ACQUISITIONS

DOD has recently expressed a commitment to improve its approach to space acquisitions and embrace many of the recommendations we have made in the past.

Our previous recommendations have been focused on providing a sound foundation for program execution. Namely, we have recommended that DOD separate technology discovery from acquisition, follow an incremental path toward meeting user needs, match resources and requirements at program start, and use quantifiable data and demonstratable knowledge to make decisions to move to next phases. In addition, we have called on DOD to develop an overall investment strategy for space in order to help DOD rebalance its investments in space acquisition programs as it continues to contend with cost increases from its programs.

These recommendations are based on a body of work that we have undertaken over the last several years that examines weapon acquisition issues from a perspective that draws upon lessons learned from best product development practices. Leading commercial firms expect that their program managers will deliver high-quality products on time and within budget. Doing otherwise could result in the customer walking away. Thus, those firms have created an environment and adopted practices that put their program managers in a good position to succeed in meeting these expectations. Collectively, these practices comprise a process that is anchored in knowledge. It is a process in which technology development and product development are treated differently and managed separately. The process of developing technology culminates in discovery—the gathering of knowledge—and must, by its nature, allow room for unexpected results and delays. Leading firms do not ask their program or product managers to develop technology. Rather, they give responsibility for maturing technologies to science and technology organizations. The process of developing a product culminates in delivery and, therefore, gives great weight to design and production. The firms demand—and receive—specific knowledge about a new product before production begins. A program does not go forward unless a strong business case on which the program was originally justified continues to hold true.

While the practices we have recommended represent commonly accepted sound business practices, until recently, they have not been accepted by DOD's space acquisition community for large space acquisitions. By contrast, these practices were implemented for the development of a small, experimental satellite, intended for direct use by a combatant command, (known as TacSat 1). We recently reported that by including only mature technologies and limiting new requirements, DOD was able to develop the satellite for less than \$10 million (including surplus hardware valued at \$5 million) and within 12 months.

In disagreeing with our recommendations, DOD asserted its desire to push programs to advance technologies as far as possible. Other reasons that space officials have given for extending technology development into acquisition include the greater ability to secure funding for costly technology development within an acquisition program versus a science and technology program, a belief among the acquisition community that labs in charge of developing space technologies do not understand their needs, as well as communication gaps between the S&T and acquisition communities.

Moreover, while DOD officials told us they were pursuing evolutionary development for space systems, we found that they were beginning programs by challenging programs managers to achieve significant leaps in capability with the intention of abandoning those efforts later in the development cycle should too many problems be encountered. This is not a true evolutionary approach, as it leaves DOD facing increased technical challenges at the beginning of a program and thus, increased risks, and it raises the expectations on the part of stakeholders who may be unwilling to accept less capability later on. Two of the systems we were most concerned

about in this respect were and TSAT and Space Radar—they were already expected to cost about \$40 billion. DOD was planning to start these acquisitions even when many of their critical technologies were still immature and it was pursuing a highly ambitious path in terms of the technology push. Given that these systems were among the most complex programs ever undertaken for space, they were being counted on to enable wider DOD transformation efforts, and DOD was already contending with highly problematic space efforts, we believed DOD could not afford to pursue such risky approaches for TSAT and Space Radar.

Since we last testified before this subcommittee in July 2005, DOD has appointed a new Under Secretary of the Air Force to be in charge of space acquisitions, who, in turn, has embraced adopting best practices, or, as he terms it, “going back to the basics.” Specifically, the Under Secretary has expressed a desire to

- Delegate the maturation of technologies—to the point of being tested in a relevant environment or operational environment, if appropriate—to the S&T community.
- Adopt an evolutionary development approach in which new systems would be developed in a series of increments, or blocks. Any desired technology that is not expected to be matured in time to start a new block would be assigned to a later block. Each block would have a discrete beginning and end point.
- Fund S&T appropriately so that significant technology breakthroughs can be continually pursued.
- Improve collaboration on requirements—consulting with warfighters on the content of each new block.

In addition, the Under Secretary is focused on estimating cost and funding new acquisitions to an 80-percent confidence level; strengthening systems engineering and strengthening the acquisition workforce.

Aspects of this approach have recently been incorporated in to DOD’s TSAT program. For the first block, satellites 1 and 2, the Air Force has reduced its expectations in the level of sophistication of these satellites to increase the confidence in the schedule for launching the first satellite in 2014. Higher performing levels of the technologies to support laser communications and an Internet-like processor router will be pushed off to a subsequent block, along with the multi-access laser communications—a more robust laser capable of transmitting vast amounts of data within seconds. Program officials have also stated that the TSAT program will not enter into product development, that is, formal acquisition, until its critical technologies are proven.

These are good steps when looking at TSAT as an individual program. It is important, however, that the Air Force ensure warfighters accept lower capability and that it makes sense to pursue the current approach versus the alternative of buying more Advanced Extremely High Frequency (AEHF) or Wide Gapfiller Satellites (WGS).

KEYS TO REALIZING DOD’S NEW GOALS FOR SPACE ACQUISITIONS

DOD’s desire to adopt best practices for space acquisition is a positive and necessary first step toward reform. However, these changes will not be easy to undertake. They require significant shifts in thinking about how space systems should be developed; changes in incentives and perceptions; as well as further policy and process changes. Moreover, they will need to be made within a larger acquisition environment that still encourages a competition for funding and consequently pressures programs to view success as the ability to secure the next installment rather than the end goal of delivering capabilities when and as promised. In addition, DOD’s space leaders will be challenged to sustain a commitment to adopting best practices, given the myriad of missions and programs that compete for the attention of DOD’s leadership and resources, frequent turnover in leadership positions, and potential resistance from the many diverse organizations involved with space acquisitions.

There are steps, however, that DOD can take to substantially mitigate these challenges.

- First, DOD can guide its decisions to start space acquisition programs with an overall investment strategy. More specifically, DOD could identify overall capabilities and how to achieve them, that is, what role space will play versus other air-, sea-, and land-based assets; identify priorities for funding space acquisitions; and implement mechanisms that would enforce the strategy and measure progress. Optimally, DOD would do this for its entire weapon system investment portfolio so that space systems that are expected to play a critical role in transformation could be prioritized along with other legacy and transformational systems and so that DOD could re-

duce pressures associated with competition for funding. But in the absence of a department-wide strategy, DOD could reexamine and prioritize its space portfolio with an eye toward balancing investments between legacy programs and new programs as well as between S&T programs and acquisition programs. In addition, DOD could prioritize S&T investments. This is particularly important since DOD is undertaking a range of initiatives—collectively known as operationally responsive space (ORS)—designed to facilitate evolutionary development, more testing of technologies before acquisition, and ultimately enable DOD to deliver space-based capabilities to the warfighter much faster and quicker. While ORS investments hold great potential, there are other S&T projects competing for the same resources, including those focused on discovering and developing technologies and materials that could greatly enhance future capabilities, reduce costs, and maintain U.S. superiority in space.

- Second, DOD could revise policies and processes supporting space as needed to adopt the best practices being embraced. For example, DOD's space acquisition policy could be further revised to ensure that a true evolutionary approach is being pursued and that blocks, or increments, will include only technologies that have been sufficiently matured. DOD could also implement processes and policies, as needed, that stabilize requirements, particularly for acquisitions that are being shared with other stakeholders, such as the Intelligence Community, and that ensure warfighters are bought into capabilities being pursued for each new system increment. In recent years, it has instituted processes for some individual systems, such as SBIRS-High, that could serve as a model.

- Third, DOD could continue to address other capacity shortfalls. These include shortages of staff with science and engineering backgrounds; shortages of experience within the program manager workforce; limited opportunities and funding for testing for space technologies; and the lack of low-cost launch vehicles. At the same time, DOD could continue to work toward strengthening relationships between the S&T and acquisition communities and coordination within the S&T community. The Under Secretary is uniquely positioned to do this given his previous position as DOD's Director of Defense Research and Engineering and his participation in previous efforts to develop a strategy for space S&T.

- Fourth, we have recommended that DOD take steps departmentwide to hold people and programs accountable when best practices are not pursued. This will require DOD to empower program managers to make decisions related to funding, staffing, and moving into subsequent phases and to match program manager tenure with development or delivery of a product. It may also require DOD to tailor career paths and performance management systems to incentivize longer tenures. Until these actions have been taken, space leaders could take steps now to ensure space program managers have the right levels of experience to execute large programs and have sufficient authority so that they can be held accountable. Likewise, DOD's space leaders can take steps to hold its contractors accountable by structuring contracts so that incentives actually motivate contractors to achieve desired acquisition outcomes and withholding award fees when those goals are not met.

In closing, we are encouraged with the acquisition approach being embraced by DOD's space leadership. It can enable DOD to begin to match resources to requirements before starting new programs and therefore, better position programs for success. Successful implementation, however, will hinge on the ability of DOD's current space leaders to instill and sustain commitment to adopting best practices over the short and long term. In doing so, best practice approaches should be reflected in policy and manifested in decisions on individual programs or reform will be blunted. They should also be accompanied by an investment strategy for space, and ultimately DOD, to separate wants from needs and to alleviate longstanding pressures associated with competition within DOD to win funding. By embracing a model that incorporates all these elements, DOD can achieve better outcomes for its space programs.

SCOPE AND METHODOLOGY

In preparing for this testimony, we relied on previously issued GAO reports on assessments of individual space programs, incentives and pressures that drive space system acquisition problems, common problems affecting space system acquisitions, space science and technology strategy, and DOD's space acquisition policy, as well

as our reports on best practices for weapon systems development. We also analyzed DOD's Selected Acquisition Reports to assess cost increases and investment trends. In addition, we met with the Air Force Under Secretary to discuss his "back to basics" approach. We conducted our review between March 6 and April 3, 2006, in accordance with generally accepted government auditing standards.

CONTACTS AND ACKNOWLEDGMENTS

For future information, please contact Cristina Chaplain at 202-512-4841 or chaplainc@gao.gov. Individuals making contributions to this testimony include, Art Gallegos, Robert Ackley, Maricela Cherveney, Sharron Candon, Jean Harker, Leslie Kaas Pollock, and Karen Sloan.

Table 1 highlights recent findings from our reports on cost and schedule overruns for DOD's current and planned space programs. The table also notes that many programs are still addressing past mistakes in acquisition approaches and contractor oversight as well as technical, design, and manufacturing problems.

Table 1: Highlights of Recent Findings for Current and Planned Space Programs

Description	Recent Findings
Space Based Infrared System High (SBIRS High): Ballistic missile warning system being developed by the Air Force to replace its legacy warning system. Development Start: October 1996	With unit cost increases of more than 315-percent over the 1996 initial estimate, the program has undergone four Nunn-McCurdy unit cost breaches. Total program costs have increased from about \$4 billion to more than \$10 billion. The launch schedule has slipped over 6 years; the first satellite is currently scheduled to be delivered in September 2008. DOD officials recently called for initiating planning efforts for the development of a new missile warning system, parallel to SBIRS; it is unclear whether this program will replace or compete against SBIRS.
Global Broadcast Service (GBS): Part of the overall DOD military satellite communication architecture being developed by the Air Force for one-way transmission of video, imagery and other high-bandwidth information to the warfighter. Development Start: November 1997	Total program costs have increased by 72-percent since the contract was awarded in 1997, largely due to the transition from a legacy system architecture to internet protocol, additional production quantities, and operation and maintenance tasks. In June 2005, a quarterly exception selected acquisition report was submitted to reflect initial operational capability delays of six months or more due to a delayed operational test schedule. GBS currently uses broadcast payloads on three Ultra-High Frequency Follow-on (UFO) satellites and will use broadcast payloads on up to five Wideband Gapfiller Satellites (WGS) satellites when they are launched.
Evolved Expendable Launch Vehicle (EELV): Acquisition of commercial launch services from two competitive families of launch vehicles. Development Start: October 1998	The program cost has risen over 81-percent, with a cost per unit increase of about 138-percent and triggered a Nunn-McCurdy breach. A chief reason for cost increases is a decline in the commercial launch market upon which the program's business case was based. In 2005, the two primary contractors agreed to form a joint venture to combine production, engineering, test and launch operations for U.S. government launches that is under review by the Federal Trade Commission.

⁴The National Security Space Acquisition Policy specifies that key decision point B (also referred to as Milestone B by the DOD 5000 series or Product Development Start by GAO best practice work) is the official program initiation point when programs develop a formal Acquisition Program Baseline (APB) and submit Special Acquisition Reports (SAR) to the Congress.

<p>Navstar Global Positioning System (GPS) Modernization: A space-based radio-positioning system that nominally consists of 24-satellite constellation providing navigation and timing data to military and civilian users worldwide.</p> <p>Development Start- February 2000</p>	<p>Total costs of the GPS II modernization program have increased by over 20-percent, largely due to DOD's decision to delay the start of the follow-on GPS III program, which will require DOD to buy additional GPS IIF satellites. The first GPS IIR-M satellite with the new military code capability was launched in September 2005. A total of 18 satellites with this code need to be on orbit to provide initial operational capability to the warfighter and this number is expected to be reached in fiscal year 2011. However, the software for the control system needed to support the operational capability of these satellites will not be operational until fiscal year 2012. Thus the satellites on orbit with the new military code will not be fully utilized.</p>
<p>Wideband Gapfiller Satellites (WGS): Satellites based almost exclusively on commercial parts being developed by the Air Force to provide interim communications support.</p> <p>Development Start- November 2000</p>	<p>Total program costs increased about 70-percent from \$1.06 billion in 2000 to \$1.81 billion in 2005. The program office estimates an increase since last year of about \$276.2 million for the program, largely due to cost growth resulting from a production gap between satellites three and four. Launch of the first satellite has now been delayed for over 3 years and is currently scheduled for June 2007. The delay will increase costs and add at least 22 months to the time it takes to obtain an initial operational capability from the system. The contractor continues to experience problems assembling the satellites.</p>
<p>Advanced Extremely High Frequency (AEHF): Communications satellite system being developed by the Air Force to replace its legacy protected communications satellites.</p> <p>Development Start- September 2001</p>	<p>Unit cost has increased by about 84-percent. In 2004, the program experienced cost increases of more than 15-percent, which required a Nunn-McCurdy notification to Congress. The program was restructured in 2004 when key cryptographic equipment was not delivered to the payload contractor in time to meet the launch schedule. Current plans are to meet full operational capability with three AEHF satellites and the first Transformational Satellite Communication System (TSAT) satellite, but additional AEHF satellites may be acquired if there are deployment delays with TSAT.</p>
<p>Space Tracking and Surveillance System (STSS): Two satellites that are going to be launched in 2007 as technology demonstrations for missile defense tests to assess whether missiles can be effectively tracked from space.</p> <p>Development Start- Restructured April 2002</p>	<p>Total program costs have increased by about 35-percent due to the addition of funds for designing and developing the program's operational constellation. The initial increment of this program, which started in 2002, is composed of two demonstration satellites that were built under the previous Space Based Infrared System-Low (SBIRS Low) program. SBIRS Low had incurred cost increases and schedule delays and other problems that were so severe, DOD abandoned the effort. The STSS program has experienced system quality and system engineering problems with the payload, however, the program office still expects early delivery and launch of the satellites.</p>
<p>National Polar-orbiting Operational Environmental Satellite System (NPOESS): Weather and environmental monitoring satellites being developed by the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, and DOD to replace those in use by the agencies.</p> <p>Development Start- August 2002</p>	<p>Unit costs increased by about 34-percent, triggering a Nunn-McCurdy review in January 2006. The launch of the first satellite has been delayed by at least 17 months (until September 2010) and could result in a gap in satellite coverage of at least 3 years. According to program officials, every aspect of the program is being evaluated by internal and external groups and several options are being reviewed for technical viability and cost effectiveness. The program office noted that any changes resulting from this process may produce substantial cost, schedule, and technical performance changes, such as removing a key sensor from the first satellite, delaying launches of the first two satellites, and not launching a preliminary risk-reduction satellite.</p>
<p>Transformational Satellite Communications System (TSAT): Communication satellites being developed by the Air Force to employ advanced technologies in support of DOD's future communication architecture.</p> <p>Program Initiation- January 2004</p>	<p>Total program costs have increased about 3-percent from \$15.5 billion in June 2004 to nearly \$16 billion in December 2004, and the initial launch of the first TSAT satellite has slipped from 2011 to 2014. The TSAT program is currently being restructured to follow an incremental development approach—an approach that is intended to help it stay within projected costs and provide capabilities to the war fighter sooner.</p>
<p>Mobile User Objective System (MUOS): Navy effort to develop a family of unprotected, narrow-band satellites that can support mobile and fixed-site users worldwide.</p> <p>Development Start- September 2004</p>	<p>This is a relatively new effort. In June 2004, DOD delayed the first MUOS satellite launch by one year to fiscal year 2010 due to a delay in awarding the development contract and to mitigate schedule risk. We reported that early procurement of long lead items before achieving a stable design for this Navy communications system could lead to cost increases and the program's development schedule remains compressed—posing risks should software development or other technical or design problems be encountered.</p>
<p>Planned Programs</p>	
<p>GPS III: Next generation of GPS being developed to add advanced jam resistant capabilities and provide higher quality and more secure navigational capabilities.</p> <p>Planned Development Start Date- Third quarter of fiscal year 2007</p>	<p>This is a relatively new effort. Initial plans were to develop these satellites and begin launching them in 2012, but DOD has delayed the start of this program so the planned first satellite launch date is now 2013. Program officials intend to use an incremental development approach for acquiring these satellites. A recent Defense Science Board study recommended a 30 satellite, three plane constellation for GPS III instead of the current 24 satellite, six plane constellation. The same study also recommended that cost and weight be key parameters in the design of the GPS III satellites, and specifically recommended measures to limit GPS III weight so that two satellites could be launched aboard a medium-class launch vehicle.</p>
<p>Space Radar (SR): Reconnaissance satellites being developed by the Air Force to find, identify, track and monitor moving or stationary targets under all weather conditions.</p> <p>Planned Development Start Date - August 2008</p>	<p>This is a relatively new effort with no reported cost increases or schedule delays. The planned cost estimate is about \$23 billion. A decision to develop on-orbit demonstration satellites to validate technology maturity and cost won't be made until 2007. The program is undergoing restructure, including a new Integrated Program Office, a new plan for risk reduction activities and revised cost estimates, and an acquisition strategy that calls for development of a smaller constellation of high performing, more affordable satellites.</p>

Source: GAO analysis of DOD data and previous GAO reports.

Senator SESSIONS. Thank you. We'll make that a part of the record. We appreciate your work and evaluation.

It's great to have the ranking member, Senator Nelson, here. I've had some opening comments. I'll let him make his comments now, and do his round of questioning if he's ready.

Senator BILL NELSON. Thank you, Mr. Chairman. I'll just submit the opening statement for the record.

Senator SESSIONS. We'll make your statement a part of the record.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

I join Senator Sessions in welcoming our witnesses this afternoon and I look forward to a good discussion on a number of key space issues. We have a late start today, as a result of the committee's full hearing schedule, so I will be brief in highlighting just a few issues.

Serious problems with most of the space acquisition programs continue, although some improvements are being seen, notably in the Transformational Communications Satellite Program (TSAT).

As the Government Accountability Office has noted, the bow wave of funding increases in the space programs in the next 5 years brought about as a result of cost overruns in the space acquisition program is \$12 billion—a staggering amount. This shortfall comes on top of significant projected growth in the same period in the Space Radar, TSAT, and other new programs. As the Nation most dependent on space systems for military as well as for civilian use, paying for the space programs is important but it is going to be difficult. These programs have to have discipline, stable, realistic requirements, realistic budgets and schedules, and mature technology to be sustained. There will continue to be a reluctance to start very costly new space programs if Congress doesn't have confidence in the requirements, the technology, the cost and the schedule.

In the TSAT program, there are improvements but they are recent and fragile, however, and there is a long way to go, and a lot of work to be done, before the TSAT hoped-for launch date at the end of 2014. I remain concerned that terminating the Advanced Extremely High Frequency satellite early, in anticipation of a successful TSAT launch in 2014, may still be overly ambitious.

In addition to TSAT, I look forward to hearing about the Space Radar program and the status of the United Launch Alliance, the Boeing and Lockheed Martin joint venture for the Evolved Expendable Launch Vehicle program, the Navy's program for ultra high frequency communications and plans to minimize any potential gaps in that capability, and the status of the designation and training of Services' space cadres.

In closing, I urge our witnesses to look seriously at less costly options for meeting space capabilities. These ideas, such as the notion of operationally responsive space, and smaller, less sophisticated satellites that can be replaced and upgraded on a more frequent basis, should also be explored.

Thank you each for appearing here today. I look forward to a good discussion. Thank you, Senator Sessions.

Senator BILL NELSON. Shall I get into the questions?

Senator SESSIONS. I would be pleased if you can start.

Senator BILL NELSON. Thank you.

Mr. Secretary, it's good to see you again. Let's talk, you and General Chilton, about the operationally responsive space for some missions—preassembled, modular, assembled on demand, launched within hours. They could be commercial satellites for a focused short term. There are many options here to explore. Let me ask you all some questions.

Is TacSat-2 fully funded?

Dr. SEGA. Sir, my understanding is, TacSat-2 is fully funded. The launch portion will be fully funded by, I believe, the end of this

fiscal year. We do have a reprogramming activity to fully fund the launch of TacSat-2.

Senator BILL NELSON. TacSat-3?

Dr. SEGA. I may need some help with that.

General HAMEL. Yes, sir, if I might. In both cases, the TacSat-2 and TacSat-3 are fully funded, and, in fact, are well along in their development.

Senator SESSIONS. Would you explain TacSat?

General HAMEL. Excuse me, sir, yes. TacSat is the acronym for tactical satellites, and these are a series of families of experiments that are being pursued by the DOD. They are being done by various laboratories. The first one of these vehicles would be flying later this year. TacSat-1 is being sponsored by the Naval Research Lab. TacSat-2 and TacSat-3 are being done, led by the Air Force's Research Lab. As I say, both of those are well along in their development. We are, in fact, now soliciting for the actual launch contract being ordered, some year in advance for that. So, we are, indeed, on course for that.

Senator BILL NELSON. How about number 4?

General HAMEL. Sir, that has not yet been awarded. We will be looking at that as a future year commitment, in terms of the budgets.

Senator BILL NELSON. What is the future vision for this operationally responsive space?

Dr. SEGA. I could start the answer to that question, Senator Nelson, and then hand it off, because it involves the operational concepts from the warfighter. It involves a robust science and technology program to continue new ideas coming forward. It involves the acquisition strategy, so that the design is correct to allow a modular approach to building the satellites. So, there's a technical aspect, an acquisition aspect, as well as operations and how you would actually employ them.

If I can go back to my previous 4 years as Director of Defense Research and Engineering, we had several initiatives. One of those was the National Aerospace Initiative (NAI) to frame the technology development, going forward. It had three pillars: a high-speed hypersonics portion, space access, and space technology. Out of the space access portion came a joint program between Defense Advanced Research Projects Agency (DARPA) and the Air Force, called Falcon. One aspect of Falcon was small launch vehicles. So, we're looking at the underpinnings of providing the launch capacity to enable operational response to space through that program. So, an effort was established for the booster phase.

The third phase in space technology was responsive payloads. As General Chilton mentioned, if you have a responsive booster, it's important that when the satellite gets to orbit, you don't have an extensive checkout time, you don't have an extensive time for it to outgas and those things that many satellites have had to do in the past. So, responsive payload technologies was also worked over the previous several years.

I would view this area in terms of a small-sat strategy. One part of that is TacSats that can be deployed quickly for the tactical commander. Another part is to look at smaller satellites to perform some of the missions that we're currently performing. So, they

would be an integral part of our constellations, and we replenish them as necessary in time, but we'd also have the capacity of replenishing rapidly, if that was the case. We also have the opportunity in the small satellites to wring out some systems in technology development, as well as science and technology.

So, these pieces, I believe, fit together. If we design these properly and TacSat-3 is a great example, and I'd invite those that can to visit Air Force Research Laboratory in Albuquerque to look at the modular approach to some of this, the systems design to enable some of the attributes in which you've just mentioned. We're putting together a strategy for this small-sat efforts to include the laboratories, the product centers, the users, Army, Navy, and Air Force, across the board.

General CHILTON. Sir, I think Dr. Sega gave a good summary of that. I could just refer back to the scenarios that I addressed earlier, and also point out that if tomorrow we were to go to war in another part of the world, we would go to war with what we have in space today, and there is no option to launch an additional satellite quickly to supplement it. We could perhaps adjust our constellations if we needed to focus additional capability in that area. What we don't have is a quick-response capability that could augment where there are shortfalls. As I mentioned, inspect where we had questions, or perhaps even replace, should an adversary just decide to take out one of our current capabilities.

These are the operational concepts that we have in the back of our minds when we think about having that capability for the warfighter.

Senator BILL NELSON. General, a priority of the STRATCOM is putting a nuclear detection sensor on the GPS system. What are your plans for those sensors to be on future GPS satellites?

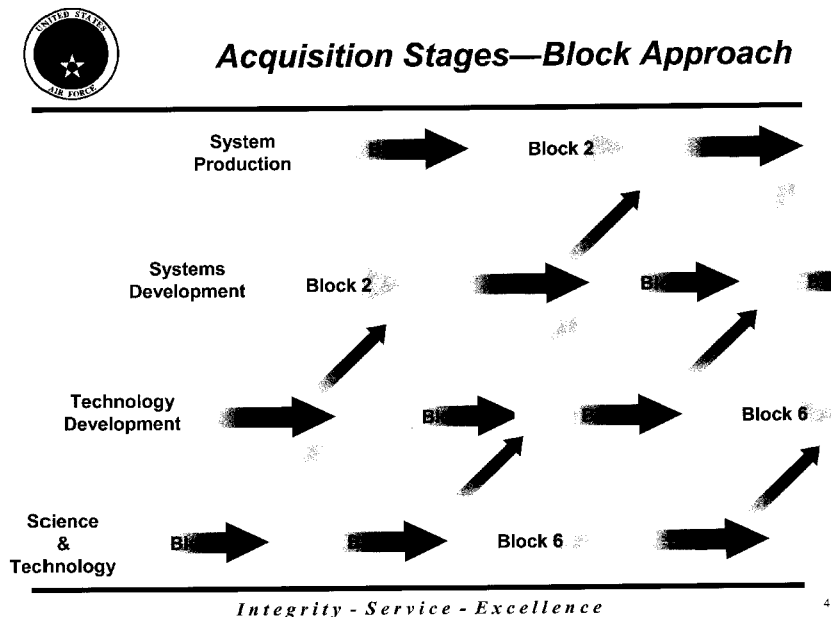
General CHILTON. Sir, I'll have to take that question for the record.

What I can say is that we do have this requirement for the capability to be able to do nuclear detection from orbit, so we can determine if a nuclear device has gone off anywhere on the planet. Personally, I'm agnostic as to the platform it's on, so long as the capability is there.

But let me take that for the record, sir, to get back to you with regard to the GPS constellation, specifically.

[The information referred to follows:]

STRATCOM has a requirement to be able to do nuclear detection from orbit so that a determination can be made as to whether a nuclear device has been detonated anywhere on the planet. Air Force Space Command is our force provider for nuclear detonation detection, and Space and Missile Systems Center, our acquisition arm for nuclear detonation sensors. STRATCOM is agnostic as to the platform this sensor will be placed upon, so long as the capability exists within a timely manner.



Senator SESSIONS. Senator Reed.

Senator REED. Thank you very much, Mr. Chairman. Thank you all for your testimony this afternoon.

Secretary Segal, this week we had a subcommittee hearing on missile defense, and one of the topics that we discussed was the future space programs of the Missile Defense Agency (MDA). Today, MDA has the Space Tracking and Surveillance System (STSS) program for warning and sensing, the N-FIRE for plume characterization. But MDA is looking at other potential space programs, beginning in 2008. Will those programs be coordinated with you, or are they operating on their own space and own direction?

Dr. SEGAL. Senator Reed, as we move forward we're working on integration across space, how different space systems will interact better than they have in the past. There's work to be done to fully integrate how we are developing and operating space systems across space, as well as how they would interact with air and surface and sometimes subsurface assets. So, that's a work in progress.

Senator REED. So, they do not fall under your capacity as DOD Executive Agent for Space. Is that officially?

I must say, I'm encouraged by your acquisition policy discussions. I think it's sensible. You've taken the suggestions of GAO and other outside stakeholders. I presume, also, that MDA is not part of this acquisition policy, because they don't fall within your purview.

Dr. SEGAL. The concept of going back to basics is one that I think is going beyond the programs that we are discussing today within this portfolio. I think that it's one that I meet with General Obering and the MDA folks. My deputy, Gary Payton, who came

from MDA can apply this type of approach. I think we would be better off. I do believe the integration and coordination is important, not only for MDA, but also the NRO.

Senator REED. But at this juncture it's more of cooperation and collaboration, rather than being within your authority for space acquisition?

Dr. SEGA. That's correct, sir.

Senator REED. A final question with respect to this set of issues. MDA is going to report to a board of directors. That's one of the things they indicated to us. Will you be part of this board of directors?

Dr. SEGA. I have to see how that forms out.

Senator REED. All right. Very good.

There is another aspect at MDA that I think touches on space, and one that could potentially raise concern. That is the proposed space test bed that they are talking about. There is no funding requested in fiscal year 2007, and MDA officials have said that no decision will be taken on whether to pursue the space test bed until 2008. The budget documents state that the space test bed is, "an essential element of the Ballistic Missile Defense System (BMDS) acquisition plan," and that would assume, to me, if it is an essential element of the acquisition plan, that they have made more decisions than they are indicating in their documentation.

You are the DOD Executive Agent for Space. Can you explain the status of the test bed, your role in the decision, what it's going to do? It seems to me this could be a very central part of our space policy. If you're the space executive, you should know.

Dr. SEGA. As we go forward and settle these areas in test and one of those is a capacity to test on the ground, the capacity to test with air simulators, if you will for example, Space Radar, to test them there, as well as the ability to test assets, with space as part of the component—is one that we're in the process of working through. If there's any further follow-on?

General HAMEL. Sir, if I might. We have a good relationship, if you will, in terms of executing the many of these space programs with the MDA. In fact, the Space Tracking Surveillance System, as well as N-FIRE, is actually managed by people that are co-located in my organization. In fact, I support them with contracting and engineering and the like. Much of the program direction and the architectures are actually directly overseen by General Obering. As a result, we have a less active role in terms of that, but it's certainly in terms of the lessons learned and how we're actually going about executing the programs. Such things as target vehicles are actually provided by my organization, so we have very much an execution-level support, our relationship with them.

Senator REED. I appreciate that. It seems to me, though, the essence of your position as the Executive Agency for Space is that you would have significant influence on all these programs, particularly one that could essentially establish literally a test bed in space, which might imply even testing things other than satellites, testing weapons, et cetera. I respect your comments today, but there is this lack of clarity as to exactly where the central point is. Are these agencies coordinating with you because they feel like it, or because you have the responsibility and the authority to

make them coordinate? I think that's an issue that we have to look at much more thoroughly.

I appreciate your comments today, both of you.

General Chilton, a final question. In your key initiatives for Strategic Command for Space, you have a couple of concepts which roll right off the tongue, but I'm not quite sure I know what they mean. "Integrate air and space capabilities to deliver combined effects."

General CHILTON. We're doing that today already with the Joint Direct Attack Munition (JDAM), you may have heard of that?

Senator REED. Yes.

General CHILTON. JDAM is essentially a package, a tail-fin configuration and a GPS receiver and an Inertial Navigation System (INS) package that we can put on one of our bombs, either a 2,000-pound class or 500-pound class bomb. The bomb is guided to the target using information that was relayed from the airplane platform that drops it. Then the bomb is updated inflight from the satellite information. This is a good example today of where we're integrating space capabilities with our air-breathing assets and those type weapons.

Senator REED. Great. I have two others, which you might answer and those are precisely what helps us understand realign resources to sustain existing space surveillance capabilities.

General CHILTON. Today, with regard to the discussion on vulnerabilities, my belief is, one of the first things you need to do to understand how vulnerable we are, and to understand the environment that we're operating in, is to have a good capability to surveil that environment and understand what's up there.

Senator REED. Okay.

General CHILTON. Classically, we've done a great job of keeping track of things in space, debris, so that when the space shuttle launches, or we launch a commercial satellite, even before we launch, we run computer programs that are tracking the debris up there to make sure we launch between the debris, or aren't going go up into a position where we could be struck. We even maneuver, on occasion, the International Space Station to avoid debris that we detect up there.

So, we have a good capability to count the dots up there, if you will. But to really understand the environment, you need to know what those dots are. What is that satellite that just was launched by another country? What is its true purpose and capability? Ultimately, through surveillance and what we call "space situational awareness development," you, hopefully, can divine intent. A very similar scenario that you could imagine in an airplane environment is where you're trying to go surveil enemy territory or even international territory to understand the environment, how many dots are out there. Are those dots civilian airplanes? Are those dots military airplanes and what is their intent? Similar thing in space. So, we need to take the step beyond counting what's up there and cataloging it and tracking it, to understanding its purpose and intent and capability. That's what we mean by "increasing our surveillance capability."

Senator REED. Thank you very much for all of your testimony today.

Thank you, Mr. Chairman. You're very gracious. Thank you.

Senator SESSIONS. Thank you.

Dr. Sega, we've recently heard reports of continuing problems on the highly-expensive and time-consuming efforts on such programs as Space-Based Infrared Radar System (SBIRS)-High, our early warning launch satellite, and NPOES, the weather satellite. The DOD is paying a considerable price for mistakes we made some years ago, mistakes largely rooted in optimistic assumptions about cost, technological maturity, and the time needed to get the job done.

How is the Air Force and DOD applying the lessons learned from those mistakes?

Dr. SEGA. Mr. Chairman, those are two of the examples that led us to the "back-to-basics" approach and the block approach. The technologies were not mature in either of the cited programs when they began. The requirements were many, in terms of what the expectation of the satellite would perform. The role of government was a bit reduced as these programs started in the mid-1990s.

The lessons learned from those two programs, and recommendations that have been forwarded by internal/external groups, including GAO, have formed the basis of the principles by which we are going forward. General Hamel mentioned many of those, in terms of the discipline, in terms of management and the systems engineering, testability, and going through solid technical side. There's also better cost estimation in simply not taking on more than what we know how to do, so that acquisition time is reduced. I believe you also will find increased accountability. As those requirements are stable, the time to complete is identified, and the tasks at hand are known, and the starting point is matured technologies. So, I think they formed part of the thought process that led to a "back-to-basics" approach, a block incremental approach, going forward.

Senator SESSIONS. With regard to the Space Radar, TSAT—can you guarantee us or give us some confidence that those programs are not likely to suffer the same kind of difficulties?

Dr. SEGA. We have put in the principles for example, in TSAT, the technologies are either at the five or six level, currently, with the next year is to mature the remaining ones that are at the technology readiness level five or six. At that point, we enter into the competition to, in fact, go to what would be, in this approach, the beginning point, if you will, of a block one.

Senator SESSIONS. Let me just see if I can put this in plain English. Not that you're not, but what you've decided with TSAT is that the first one, you're going to put in it the capabilities that you have great confidence in, that's mature. As time goes by, and as the technology matures, the next satellites can be more sophisticated and have more capability. Is that the way this acquisition block approach is?

Dr. SEGA. Yes.

Senator SESSIONS. Is that what it boils down to?

Dr. SEGA. Yes. So, incrementally, building in there, but each step of the way—and, in fact, a continuous process. I view it as important to have the users, the warfighters involved from day one, all the way through the process, as well as the technical people, the acquisition folks, the logistics folks, operators, so that as we identify what should be in block one. We're also engaged as to have the

needs changed for a block two from what we had previously thought would be in block two.

Senator SESSIONS. Needs are based on the warfighter or the customers' needs will also impact what you put in the next block.

Dr. SEGA. Correct. We will converge on what is in a block two, from a user standpoint, as well as a provider standpoint. So, we will work hard on that systems development for what would be available for a block two, as well as what needs are available, and then we define that as well.

We have a sense of where we want to go on TSAT for block two, as we had a bit more aggressive goals, in terms of the capacity of the laser communications and the capacity of the router.

Senator SESSIONS. What about the Space Radar? How are you coming along in setting your goals and expectations there?

Dr. SEGA. In Space Radar, currently, we are going through the Joint Staff and through Vice Admiral Chanik to these process leading up to an assessment by the Joint Requirements Oversight Council (JROC) process, in conjunction with our folks on the acquisition, to identify what would be available in a block one, and what its value would be. It's only after that convergence view that we lock in what we want to do on a block one.

Senator SESSIONS. Ms. Chaplain, you've evaluated this. The "back to basics" program, the acquisition stages, block approach that's been described. Is that responsive to the concerns GAO has stated? How would you evaluate the situation today?

Ms. CHAPLAIN. The approach that Dr. Sega described, that he's taking with TSAT and wants to take with other programs, aligns with the best practices we recommend. One of the most critical things we think programs need to do is match resources with requirements before they ever start. One of the most important aspects of that is making sure you've proved out your technologies before you ever start, before you make that commitment to spend large amounts of money on a program.

For many years, space programs have not been doing that, and—as have another number of other weapons systems. So this is like the first biggest step that needs to be made to get a program on a more executable track.

That said, we have concerns about both TSAT and Space Radar that need to be addressed. TSAT, the spending's going to go up some \$400 million next year. We are still trying to find out exactly where that money's going to be spent in enough detail to give us assurance that the spending is wise. Warfighter acceptance: we are still hammering that down through discussions with the Air Force, to the extent the warfighters have accepted the trades that have already been made on TSAT.

The effect of the new TSAT capabilities on systems like Space Radar and Future Combat Systems (FCS): the Army's FCS is going to depend highly on the environment that TSAT supports to send information to among all these Army systems. If there's less capability than accepted, is FCS going to still work in that environment? Same with Space Radar. If Space Radar can't quite use all of the TSAT as it's laid out now, what's going to be used in its place to make sure Space Radar can still send that kind of information?

Then, of course, we have the larger question of affordability. We have cost overruns on a lot of these other programs. Can we afford TSAT now? This kind of question really needs to be looked in the larger DOD weapons system portfolio for trades.

Space Radar, we're still looking at this system, and we plan to do some more detailed review on it. But we have a number of questions at this point that we've been asking ourselves. Again, affordability. This is going to be a very expensive program, and is this affordable within the context of the whole portfolio? Requirements: are there too many on the program right now, or do we have just the requirements we need? Cost sharing: has that been worked out with the Intelligence Community and DOD? We're still looking into that question. We would like to also understand what the level of sophistication's going to be in the first increment of Space Radar, and I don't think we've learned that yet. Again, the trades between TSAT and Space Radar, is this going to all work out as planned?

The schedule at our first preliminary review looks kind of ambitious, so we would like to learn more about the schedule and what exactly it's going to involve and how DOD's really going to achieve all the milestones it intends to achieve once it starts its acquisition.

Those are a lot of questions, and they make us wonder, is it time now to start a Space Radar acquisition, or do we need to step back and think through it more and what it means in the larger context of the entire space investment portfolio?

Senator SESSIONS. Let me just briefly, Dr. Sega, ask you on the Space Radar, how much will it cost, and do we have an agreement with the Intelligence Community on cost sharing?

Dr. SEGA. We have an agreement with the Intelligence Community. This would be a joint program. The financial contributions from the Intelligence Community are still being worked. The cost of the Space Radar program, if I could kind of frame this up, in terms of the capability and the sophistication of block one, is in the process of being defined. That will be done in a similar way that we did TSAT, with the users and acquisition people working together. In that case, it was the QDR. In this case, the combatant commands and through the JROC process will be involved on the requirements and also on the technology side.

We will take advantage of the technology we've been developing for decades in phased arrays. They have been developed on a ground-based system. We have sophisticated electronically steerable arrays in our F-18, our F-22, Joint Strike Fighter (JSF). So, the basis of the technical piece has been worked for decades now.

Senator SESSIONS. What about on the cost? What can you tell us, as specifically as you can, what cost you're projecting?

Dr. SEGA. I appreciate the question.

Senator SESSIONS. Ultimately, we may not know what all we'll utilize and how much, but what can you foresee now?

Dr. SEGA. A misperception is the number of satellites that would be needed in Space Radar. That's why some of this architectural piece will be done. Some of the numbers end up very large if your assumption is a large number of satellites. If it's more in the eight to nine kind of category of satellites, obviously the cost is much less than 20-some satellites. So, that architectural trade, in terms of the use of Space Radar to not only cue other assets in space, but also

cue airborne platforms, some of which have radars on them—Joint STARS, our other airplanes have a lot of radars—and to help them in the overall awareness and battlespace characterization, is going to be important. So, how it is used, and what value it has, in terms of leveraging a radar image from space in some of the denied areas that General Chilton talked about, and how it interacts with the other system, determine the number of radars that are needed and the sophistication that you'd need on block one. So, I'd like to give you a solid number, but there's a lot of variables right now that prohibit that.

Senator SESSIONS. What is just the numbers, as you recall, for the fiscal year 2007 request? What do you project through the Future Years Defense Plan (FYDP). The 5-year projection?

Dr. SEGA. Yes. The numbers are roughly in the \$260 to \$270 million in fiscal year 2007—I can get the exact number—and a bit over \$4 billion over the FYDP.

[The information referred to follows:]

The President's budget for fiscal year 2007, as submitted on February 6, 2006, included \$266.4 million in research, development, test, and engineering funding for Space Radar across the FYDP, which covers fiscal years 2007–2011.

Senator SESSIONS. Ms. Chaplain, just briefly, your concern is that it may be higher than that before the 5 years is up?

Ms. CHAPLAIN. Yes.

Senator SESSIONS. \$4 billion?

Ms. CHAPLAIN. Our concern is, we don't know how much it costs, and that won't be known until the architecture's defined and all the trades are made.

Senator SESSIONS. This basically represents what we might call a "guesstimate"?

Ms. CHAPLAIN. Right.

Senator SESSIONS. Because it is based on 20 or 9 satellites, Dr. Sega? Or do you know yet? So you can't really be specific, because the technology is not there, and you've not made a firm decision?

Dr. SEGA. Right.

Senator SESSIONS. Capabilities are per satellite?

Dr. SEGA. That is correct.

Senator SESSIONS. That's how sometimes we get into problems, I guess, Ms. Chaplain would say, because we are not real sure. I won't pursue that in more depth, but I think it does point out the difficulties you face. We can't dismiss the fact that some of these things need to get started, and they need to be produced, and you can't know all the difficulties until you get into it. We know that. But to the extent to which we can be more predictive and act on more mature technology, as you have said you intend to do, I think that can eliminate some of the surprises that hit the budget awfully hard. Would you agree, just briefly?

Dr. SEGA. Absolutely. That definition is critically important to us, maintaining cost and schedule and discipline in the programs going forward.

Senator SESSIONS. Congress has the responsibility. It's the taxpayers' money. You're talking about \$1 billion here and \$1 billion there. It's real money, and there are other programs that desperately need resources.

Senator Thune, thank you for coming, and thank you for your active participation in our committee.

Senator THUNE. Thank you.

Senator BILL NELSON. Mr. Chairman, just on that, there are some estimates as high as \$40 million on that program. Can we afford that, Mr. Secretary?

Dr. SEGA. Senator Nelson, in the smaller constellations, I have not seen a number that high. I'd like to have General Chilton address this a bit, because the recent inputs from the combatant commanders, in terms of needs for night, all-weather capability, is one of the principal reasons that's driving us toward bringing on this capability.

General CHILTON. I'd be happy to.

I think one of the things we learned back in Operation Desert Storm, and we all saw on our televisions, was the spectacular advantage we had over our adversary back in 1991 in being able to fight at night. Night-vision goggle technology, stealth technology, going in at night, those visions over Baghdad of pilots going downtown and coming out unscathed were pretty spectacular.

As we move forward to later conflicts in the 1990s, on into Bosnia or Kosovo there, I think what we learned the advantages of the technologies I talked about earlier, with the JDAM and space integration, but also the shortfalls of operating in a nondesert environment, where there's real weather and you don't necessarily own the night as well as you do when you have favorable weather conditions. We learned the leveraging advantage of being able to see through the weather with this radar imaging technology that we have fielded on some of our airplanes, to include the B-2 bomber and the F-15E and the F-18 now being able to have that capability from space, where you could see, with good resolution, day, night, all weather, into enemy territory, would be a tremendous leveraging advantage for our warfighters in the field.

I'd just kind of walk you through these technological breakthroughs or identifications that I think really do give us a great capability.

In the past, the combatant commanders have not had as much of an input into the requirements for these types of systems. That's started to change over the past year. General Cartwright, along with the Commander of the Joint Forces Command, General Smith, co-chair a forum called the Senior Warfighters Forum, where they get together the vice commanders of all of the combatant commands from around the world—CENTCOM, Southern Command, Pacific Command, et cetera—and they sit down, and work to help define the requirements for where we need to go forward in the future.

It is this type of forum that will be working in close concert with the developers to lay out the requirements that we would need to define what that radar satellite ought to look like and the numbers that you would need to support it.

So, that work is ongoing, but a good bit of work is still in front of us, as mentioned.

Senator THUNE. Mr. Chairman, I want to thank the members of the panel for being with us today, and for your insights on a lot of these issues.

Secretary Segal, I do have a question that pertains to something I was involved with in the National Defense Authorization Bill for Fiscal Year 2006, and that required the Department to submit to the committees a report on the feasibility and advisability of using the Space Radar for topographical mapping for scientific and civil purposes. My understanding is that work is underway, and is there an interim report that has been prepared or anything you might be able to share with us?

Dr. SEGAL. Senator Thune, I'd characterize it as a rough draft now, but it should be in final form. As I understand it from our folks, I think the due date is by May 1, as I recall the due date on the report. They have worked through various examples where an X-band radar is quite useful. So, there's also a forum that is in place for those to look at the needs across the community. The representative for civil needs is, I think, out of the U.S. Geological Survey (USGS) office that attends these meetings. So, there is input into the process in development of the radar, but there's also examples, I believe, that will be present in the report as it comes forward.

Senator THUNE. Is that something that you say is in draft form. By May 1, would we have access to something that we could see?

Dr. SEGAL. That's my understanding.

Senator THUNE. Okay, good.

Do you think that it would be worthwhile to establish another unclassified frequency for Space Radar, where other agencies, such as Department of Agriculture, Department of Energy, USGS, as you mentioned, et cetera, could use, especially if they were willing to help with cost sharing?

Dr. SEGAL. At this point, having not done the analysis, I don't know what the level of need is and whether the frequency that we are focusing on, X-band, is the correct one for that community. So, I'd allow that process to work out and understand what the needs are and how they would be addressed by radar as we have examples of other radars that have different frequency bands for example, the Canadian radar sat, I believe, is a C-band-based radar. So, I think understanding the needs and how they would be addressed would be the next step.

Senator THUNE. Yes, if they were willing to participate in the cost, if there's a capacity to do it, there are a lot of needs that I think are—and I'm just giving you a couple of areas, in the area of agriculture, vegetation classification, vegetation land cover, crop identification, forest health, things that could really be—the technology could be enormously helpful in some of these other civilian areas. It's something that we've had some folks in my State who have had an interest in pursuing, and I would encourage and welcome your input and consideration of that as a possibility, as well. It's something that I think has some value, obviously, to the other agencies that would benefit from it.

General Chilton, changing gears for just a minute, one of the joint command components under your command is Integrated Missile Defense. In your statement, you say that the United States is reducing our dependence on nuclear weapons in order to assure our allies and dissuade competitors, and deter those who plan to harm us, particularly with weapons of mass destruction. Now, while we

may be reducing our dependence on nuclear weapons, it appears evident that nations hostile to us are embracing a reliance on nuclear weapons. I guess I'm interested in knowing what your assessment is of the nuclear delivery capabilities of countries like North Korea and Iran, and are we able and in a position to counter those threats?

General CHILTON. Sir, first of all, if I could make one minor correction, my boss, General Cartwright, oversees me, as the Space and Global Strike Commander, and my colleague, Lieutenant General Larry Dodgen, is the Commander for Integrated Missile Defense (IMD). General Dodgen does not work for me. So, we're peers in the organization. I hesitate to tread into his area for IMD.

I could comment, though, on a couple of areas with regard to reliance on nuclear weapons and options with regard to global strike that General Cartwright has expounded on and that fall right in my lane.

The change in the Cold War paradigm and the fact that we've gone from a military posture and national military strategy, vis-a-vis the Soviet Union, where nuclear weapons were what we used to deter their activities. We've found today that there are adversaries out there, two of which you've named, that perhaps may not be deterred by our nuclear might, and to that group I'd add, the fellows in organizations like al Qaeda, who couldn't care less whether or not we have nuclear weapons. So, with regard to that, STRATCOM is looking for other alternatives, be they conventional, kinetic, nonkinetic options, to deter, dissuade, and then ultimately defeat our adversary, weapons that would not be what you might call self-detering in their use. Would you really commit a nuclear weapon against that target, or can you better, or perhaps equally, service that target with a conventional weapon that may be more acceptable to the international community, and, indeed, to the American public to employ? Those kind of philosophies is what we're talking about in that particular statement with regard to reliance on nuclear weapons.

A little bit on the adversary and threat, certainly in my lane, in Space and Global Strike. When you look at a country like North Korea, who claim they have a nuclear program, and you look at their capability and their missile development technology through Scuds, Nodongs, and the Taepo Dong missiles, you have to be concerned. Even recently, in the newspaper you've seen Iran come out touting the improvements in their ballistic missile capabilities publicly, and advertising those capabilities, and how capable they are, and intend to become. So, certainly along those lines, when you look at those capabilities, you have to take that into account.

The New Triad that is discussed in the DOD talks not only about offensive capabilities and flexible infrastructure, but also about a defensive capability to help us give the same certainty that we had back when it was us and the Soviet Union just holding nuclear weapons over each other. We now have this concept that you not only have to have a credible striking capability that has to be both nuclear, conventional, and nonkinetic, but you also have to have a credible defense, and then a flexible infrastructure that could respond to an attack and continue to sustain our way of life and our operations.

I hope I've answered your questions along those lines of the statement. If I haven't, sir, I'd be happy to expand some more on those.

Senator THUNE. I think that gets to the heart of what I was asking. They've handed me my note that says my time's expired. I will yield back to the chairman.

Thank you very much.

General CHILTON. Yes, sir.

Senator SESSIONS. Senator Nelson.

Senator BILL NELSON. Admiral, is the Navy interested in space? [Laughter.]

The answer is yes. I'll answer for you. I want to compliment you that your Multiple User Objective System (MUOS) program is on budget and on schedule.

Admiral, answer for us how does the Navy remain fully engaged in space programs, or does it just become a user of space technology?

Admiral DEUTSCH. Senator Nelson, thank you and yes is the answer. We are very much interested in space. I will take that compliment on MUOS, but I'll be much more comfortable when the first satellite is launched in 2014. I'll finally open up that bottle of champagne when all five are in orbit.

The Navy is very much interested in space, and I think we are very engaged, as we talked earlier. Our requirements process is rather robust. We make sure that what we need is injected in the joint system. As far as what we would like to have in areas like operationally responsive space (ORS), we remain engaged very robustly with our fellow warfighters. I'm fairly confident that we remain engaged, and we will in the future.

Senator BILL NELSON. Okay. So, you're definitely interested in ORS?

Admiral DEUTSCH. Sir, we are very interested in the capabilities that ORS provides.

Senator BILL NELSON. Okay.

Mr. Secretary, let's talk about EELV. What's the status of the merger process?

Dr. SEGA. The United Launch Alliance proposal was submitted to the Federal Trade Commission (FTC), a request from the FTC to the DOD to provide information, and that has—

Senator SESSIONS. Let me just interrupt. We're dealing with the launch vehicle that—the numbers expected to be needed were reduced, and two providers have discussed merger. So, we'll have a single source, rather than two sources on the vehicle. So, maybe you, from there, can give us the status of where that process is today, as Senator Nelson asked.

Senator BILL NELSON. Do you support the access to space through two launch providers?

Dr. SEGA. Let me just segment the questions up here a little bit.

The two boosters, for medium and heavy launch, are the Delta 4 and Atlas 5, different propellants, different engines in the two systems. With the proposed merger of the Boeing and Lockheed Martin launch teams to one, they still will be providing two different propulsion systems and propellant combinations as we go forward. Both of them are relatively new boosters, Delta 4 and

Atlas 5. Both have been very successful in their early launches. We are providing our inputs. We are positive toward the concept, but there are a lot of details. We are not the deciding authority in the U.S. Government on that merger, but, rather, the FTC. So, in the Air Force, we provide our information and answer the questions that are asked to the Office of Secretary of Defense, who in turn meets with the FTC, answers their questions, and they're working through the proper process, and the FTC will be the deciding party.

Senator BILL NELSON. Are you providing the FTC with the information it needs?

Dr. SEGA. I believe so.

Senator BILL NELSON. We need to get on with it. It'll solve a lot of the EELV issues, won't it?

Dr. SEGA. We believe that the two teams will, in fact, be able to share some of the expertise knowledge that they have in a positive way. But there are many considerations, and I need to leave those decisions to the folks that are supposed to make them.

Senator BILL NELSON. Let's assume that the FTC approves the merger. Then are you satisfied, as the Secretary, that you're going to have the assured access to space through two launch providers?

Dr. SEGA. Assured launch—assured access to space is the principle which we will hold firm to. It is an enabler for us to get space capabilities on orbit and serve the warfighter. The details of how we get that are also very important, so I would wait until seeing how the outcome turns out before giving an assessment.

Senator BILL NELSON. Now, are you raising the question here before our committee as to whether or not there should be a merger?

Dr. SEGA. I'm saying that the folks that you have in front of you right now are not the ones that are deciding it. We've provided the information to it. I'm positive, as is the Air Force, on the concept of bringing these two launch providers together. The assumption, as we develop the EELV program, and potentially—and General Hamel could comment on this as well on some of the details—but it was assuming a commercial market which did not occur. So, there's a limited number of launch needs that our Nation has for medium- and heavy-lift launch vehicle. So, it's important that we focus on assured access to space. This may be an opportunity that, in fact, aids us in getting that assured access to space. It has many positive features, but we have to do due diligence on a merger so it is in the best interest of the U.S. Government that other people in that industry, as well as those that want to provide satellites for launches. I remain positive on this concept.

Senator BILL NELSON. Who makes the policy decision that the merger will give us assured access to space?

Dr. SEGA. Our input on the national security aspects of this merger are from the DOD. I would consider one of the prime inputs, but not the only one, to the FTC.

Senator BILL NELSON. Are we relying on the FTC to make the policy decision that the merger gives us assured access to space? Are we relying on you? Are we relying on the Secretary of the Air Force? Are we relying on Secretary Rumsfeld?

Dr. SEGA. The organization within the DOD that has been the lead in providing that input to the FTC has been the Under Secretary of Defense for Acquisition, Technology, and Logistics. The

Air Force has been the prime supporter of data required to make the decision that is the right one. Our concern is access to space. We make the case. We have made the case, in terms of what we believe is the pros and cons of this particular proposal.

Senator BILL NELSON. So, are we relying on Secretary Krieg for that input? Who do we bring to this committee to give us the answer to the policy question that the merger is going to give us, in their opinion, assured access to space?

Dr. SEGA. I would view that we look at the risk, we look at mission assurance and I will turn this over to General Hamel here in a bit in terms of what they have done at SMC to enable us to have 43 successful operational launches. If you count the test flight out of Florida, in the Delta 4, it's 44. The mission assurance process and what they see day-to-day, in terms of what enables us to have the mission assurance in the launch business.

General HAMEL. Sir, if I might just add a bit to this, that currently we have two separate launch vehicle providers for the Atlas 5 and the Delta 4. We are taking those from previous commercial contracts now to government-managed efforts. Our national policy is, we will have assured access. We will do that with the two independent companies, if need be, and that's the basis of our budget request. However, if it turns out the FTC, based upon inputs from all parties, including the companies, DOD, concludes that it's in the best interest to allow this merger to proceed, then we'll be in a position then to continue to have assured access with a single joint venture, but, by the same token, we can maintain the assured access by having two independent contracts. We do see benefits, in terms of efficiencies and mission assurance benefits, under a joint venture, but, again, that is subject to other people's decision.

Senator BILL NELSON. Who are those other people?

General HAMEL. Sir, it would be the FTC, as Dr. Segal says. Clearly, the DOD is going to be making inputs, and is in consultations at this point. But there will be competitiveness questions, and other issues will be brought before the FTC.

Senator BILL NELSON. I think what our committee would like to know is, who, at the end of the day, is going to be responsible, and is going to sign off that this merger between two companies in this new kind of venture, called United Launch Alliance, is, in fact, going to give us the assured access to space? Not the vehicles. We know the vehicles work. We're talking about the new kind of arrangement of operations. Is that a decision that's already made?

Dr. SEGA. Senator Nelson, I'm concerned that the processes are good, and that General Hamel and his organization assures us that each and every booster is ready to go. So, we can't not pay attention to the details of every booster. We look at the overall processes. I think there are different business models that would still allow us to have the highest quality booster possible for the particular launch, and give us the mission assurance that is our bottom line.

Senator BILL NELSON. General Hamel, let me ask you how does the Air Force intend to implement block three?

General HAMEL. Sir, as I mentioned, the original concept of the program for EELV was a joint government/industry partnership. As a result, it was done as a commercial development. As a result

of the collapse of the commercial satellite communications market, there's no longer as much demand for commercial launch services. So, we are transitioning these contracts from—which had previously been commercial contracts, now to a more classical defense contract. We're going from what's referred to as a Federal Acquisition Regulation (FAR), FAR Part 12, to a FAR Part 15 contract. So, our intent here is with each of the two companies, Lockheed Martin and Boeing, to put in place contracts that will allow us to manage the engineering workforce, the supplier chain, and the infrastructure to assure that we maintain critical skills, and then separate contracts would be let with each of the two companies in order to buy, on a firm, fixed-price basis, the individual boosters, as we order them.

Our intent, as I say, is to move to a government-managed launch capability, as well as a launch booster procurement basis. That's what we're in the midst of, at this time.

Senator BILL NELSON. For example, how far in advance does a launch vehicle have to be assigned to a particular satellite?

General HAMEL. Sir, typically, under our current arrangements, we will order specific launches for specific satellites 24 months in advance of the need date.

Senator BILL NELSON. Will the new United Launch Alliance give you more flexibility in assigning those launch vehicle assignments?

General HAMEL. Sir, I don't believe that it's going to make a material difference. We will still look at what is the best provider, whether it's done as two separate contracts or if it's merged together under the United Launch Alliance.

Senator BILL NELSON. The concept behind EELV is to give you the flexibility that you could launch on short notice. So, what is "short notice"?

General HAMEL. Sir, typically we'll order a launch, as I said, 2 years in advance. In some cases, we may choose to do all of the integration work. In other words, understanding the loads and the electrical interfaces for both a Delta 4, as well as an Atlas 5. If we actually did the integration work for a particular satellite for either vehicle, we could go as close as 10 to 12 months in advance of a launch of actually planning which of the two boosters we would fly on. This is significantly shorter-term decisions than what we currently have, where you typically are years in advance of having to select a particular booster. We will have much greater flexibility with the EELV.

Senator BILL NELSON. Does this cut out a third party, like SpaceX, that might want to develop a heavy booster?

General HAMEL. No, sir, absolutely not. As we've said, that any qualified provider that can meet our mission requirements and has requisite demonstrated success, we will make calls, on an annual basis, as to who would be able to provide us a launch option. Again, that would be ordered up 2 years in advance.

Senator SESSIONS. All right. We talk about the commercial satellite services. I believe that commercial satellites provide about 80 percent of our communication needs during OIF. Will the DOD continue to rely on commercial satellite communications in the near- and mid-term? What steps are you taking to ensure that the commercial satellite services the Government needs will be there when

we need it? Are we in pretty good shape there, or are you—do you have serious concerns there?

Dr. SEGA. Senator Sessions, we are using commercial satellite providers. Communications, as you mentioned, is, I would say, about the 80 percent figure in OIF. It is our planning, going forward, is it'll be an integral part of our communications architecture. So, we do work with the satellite providers, com providers. The actual ordering of satellite services from the commercial providers is through the Defense Information Systems Agency, not through our offices, but through a defense agency for the actual contracts with the commercial providers. But we also work with them and try to be helpful, in terms of information exchange that their product to us is the best it can be. But it's an integrated part of our communications architecture going forward.

Senator SESSIONS. I notice that Ms. Chaplain noted in her testimony that over 5 years, \$12 billion less has been available to spend on acquisition and development as a result of cost overruns, I guess costs and expenses on these kind of programs that were not anticipated. Now, I know that happens in private business. It happens anywhere. We need to do a better job about that.

Probably you may have some counterpoints that you would make to say \$12 billion may not be perfectly accurate. I don't know. Usually there are two sides to those kind of issues. But I would just note that I do think, and I am pleased to hear, that you're beginning to address the root causes of this, as GAO has pointed out, and that apparently your predecessors were not so sensitive to the recommendations that the GAO has recommended, and that you are addressing these issues by lowering technical risk, assuring realistic cost estimates, and not biting off more than you can chew. Those are things that just have to be done, because we do face a dangerous time that has been referred to as a bow wave of demands coming upon us in not too many years. So, we're interested in that.

I hope that this will continue to be a high priority of yours. The Secretary of Defense—I assume that's why he put you there, to make sure that we address this issue in an effective way. In fact, I think it was.

Ms. Chaplain, let me just ask these questions about the general program, and then I think we'll wrap it up. We've had a good exchange this afternoon.

One of the suggestions and concerns expressed by GAO was that competition for funding among good ideas—a lot of people have a lot of good ideas in Air Force, the whole DOD, and the other branches of the Government—and that DOD has had a difficult time in prioritizing and setting priorities for which ones need to be given funding. So, do you concur with that, Dr. Sega, that that has been one of our problems? Can we develop not only an Air Force-wide, but a DOD-wide process to help eliminate that problem that seems to be a driving factor in cost overruns?

Dr. SEGA. Mr. Chairman, when resources are limited and there are several options on the table, then there'll be a competition. But I believe that as we look at what is most effective for the joint warfighter and what, as General Chilton said, effects you're trying to achieve, then you look at the trades of different ways of solving

that problem. So, their involvement is absolutely crucial in us identifying an investment portfolio in the acquisition community that's bringing the maximum result and effect to their needs.

Senator SESSIONS. General Chilton.

General CHILTON. Yes, I'd agree completely. I'd just highlight that at this point in time, we're in a difficult situation in space with regard to recapitalization. I can't think of a single constellation that we have up there now, whether it be the early warning satellite constellation or the GPS constellation or a communications constellation, the Ultra High Frequency (UHF) the Navy uses, or the Super High Frequency (SHF) that the Army uses. I can't think of a single one that we don't have a program in development to replace them right now, all coming together at exactly the same time.

Yet, every one of these things is important to the warfighter. We've become accustomed to using them. We've tailored the way we fight our fights around these things, and we need them.

So, these are tough times to make these hard decisions, and I, for one, am very encouraged by the steps that I've heard that the Air Force is taking to bring cost and schedule and risk under control, as Dr. Sega has laid out here, because I think that is going to be very important if we're going to deliver these capabilities to the warfighter in a timely manner.

Senator SESSIONS. You've made clear what the soldier and the sailor and the airman and marine need to see over that hill, across the horizon, see where those threats are. It's absolutely a critical part of our Nation's defense capability. It's part of our strength, and we never want to commit our personnel in harm's way and have them blindsided when we could well have protected them from those kind of threats. I really do believe this is a critical area.

We have the operationally responsive space, which allows for capability of bringing in some lower-cost services that can be available to us. We will hopefully see, as time goes by, that, in some things, in terms of satellites, costs have gone down. But one reason we have so few commercial launches is that the satellites are lasting longer than were projected, and one satellite can do what it used to take multiple satellites to do. They're lasting longer, and they do what four of them used to do. Now you don't need to launch as many. So, those kind of cost savings also need to be a part of our future.

The capability must be there, and we need to make sure that it's met. You can count on this subcommittee to be responsive to your reasonable requests to make sure that this Nation has preeminent capabilities in space.

Dr. Sega?

Dr. SEGA. Mr. Chairman, I have one correction for Senator Thune that was passed up I think. Apparently, I was a little optimistic on the report that I know is in draft. To answer his question, the interim results will be available June 1, rather than what I said. I wanted to put that in the record.

Senator SESSIONS. I will make that part of the record.

Does anyone else have anything to add before we adjourn? [No response.]

Thank you very much for your service to your country. It's obvious to me, and, I think, to anyone who's observed this hearing, that

you are people of great capability and experience, and we're glad you're there providing for the defense of America.

We are adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

BASICS APPROACH VS. CURRENT SPACE ACQUISITION POLICY

1. Senator SESSIONS. Dr. Sega, with your emphasis on returning space programs "back to basics," should the National Security Space (NSS) acquisition policy be revised so that it is more closely aligned with the "back to basics" approach?

Dr. SEGA. The fundamental tenets of the "back to basics" approach are consistent with NSS Space Policy 03-01. Specifically, NSS 03-01 states that Evolutionary Acquisition, of which a bloc or incremental approach is one process, is the preferred strategy for the acquisition of mature technology. The repositioning of the System Design Review (SDR) before Key Decision Point B (KDP-B) in the 27 December 2004 iteration of NSS 03-01 was an important step to improve risk management. NSS 03-01 requires capability documents to be updated before each KDP to strengthen collaboration between the requirements and acquisition communities. Finally, NSS 03-01 directs program offices to elevate system engineering principles to the same level as cost and schedule programmatic considerations.

SPACE RADAR

2. Senator SESSIONS. Dr. Sega, Congress has been concerned about the ambitious nature of the Space Radar program, its potential costs, and requirements coordination with the Intelligence Community (IC). How will the Air Force integrate the "back to basics" approach on Space Radar?

Dr. SEGA. The Department of Defense (DOD) and the IC have already begun a common path towards requirements definition. The Initial Requirements Document for Space Radar was validated by both the IC's Mission Requirements Board (MRB) and by the Joint Requirements Oversight Council (JROC) in February 2006. This provides top-level qualitative requirements for the program. The Capability Development Document, which specifies the quantitative detailed requirements, is in development between DOD and IC user communities and on schedule to support Key Decision Point B.

The Space Radar plan is not to proceed into Phase B until technology is mature. We have incorporated lessons learned (from the Young Panel report, and other space programs) into the Space Radar acquisition strategy and cost estimating to provide more accurate assessments of Space Radar program cost and risk.

To implement a "back to basics" approach, the Space Radar program is developing an evolutionary acquisition approach that would reduce program risks. Results of this work will include definition of a Block 1 satellite program, with an estimated cost of the first satellite, a total estimated cost for Block 1, and a life cycle cost estimate for developing, building, and operating the constellation.

3. Senator SESSIONS. Dr. Sega, what is the basic architecture for Space Radar? For example, how many satellites do you anticipate for the entire constellation?

Dr. SEGA. In response to the Initial Capabilities Document (ICD), validated by the JROC and the MRB and the Draft Capabilities Development Document requirements, we have identified a Government Reference Architecture which contains nine satellites in low earth orbit (plus one spare) and an interdependent ground capability which will interface with other space and airborne systems to support the horizontal integration of intelligence, surveillance, and reconnaissance capabilities.

4. Senator SESSIONS. Dr. Sega, how much do you estimate it will cost to develop and acquire the full Space Radar capability?

Dr. SEGA. We are developing the program in measured steps, in order to reduce early program risks. Results of this work will include a total estimated cost for nine satellites in low earth orbit (plus one spare) and investment in the ground segment. We continue to work on an updated cost estimate (the initial program office estimate falls in the range of \$20-\$25 billion) of the Government Reference Architecture (GRA) as it is refined by the JROC and the MRB processes.

5. Senator SESSIONS. Dr. Sega, what guarantees do we have that the IC will share in the development costs?

Dr. SEGA. In January 2005, the Secretary of Defense and Director of Central Intelligence committed to pursue a common Space Radar designed to satisfy needs of both the National Intelligence Community and the joint warfighter. In recent Space Radar Executive Committee meetings, senior Office of the Director of National Intelligence staff have reiterated their support for the Secretary of Defense/Director of Central Intelligence agreement.

6. Senator SESSIONS. Dr. Segal, when can we expect a concrete cost share agreement?

Dr. SEGA. The January 2005 Secretary of Defense/Director of Central Intelligence agreement directed the Under Secretary of Defense for Intelligence and Deputy Director of Central Intelligence for Community Management to recommend an approach for cost sharing of program acquisition in the fiscal year 2008 budget deliberations. Once the acquisition approach is further defined, an estimate supporting this approach will be used for initial cost sharing discussions between the DOD and the IC. Final cost sharing allocations will be based on a single agreed upon Independent Cost Estimate, at which point discrete costs can be allocated and programmed by the appropriate agency.

SPACE INDUSTRIAL BASE

7. Senator SESSIONS. Dr. Segal and General Hamel, there have been concerns in recent years about consolidations within the space industrial base, the decreasing pipeline of scientists and engineers, and even concerns about whether large space contractors have the capability to get the job right. Is the current and projected U.S. space industrial base sufficient to meet national security requirements for the next 15 years?

Dr. SEGA. Attracting and retaining well-qualified scientists and engineers into the National Security Space (NSS) community, both within the government and among our many industry partners, is one of the critical areas which we are addressing. More and more, our Tier 1 (prime) contractors depend on our equally vital Tier 2/3/4 suppliers. Data concerning the availability of scientists and engineers is limited.

The NSS Space Industrial Base Council, which I co-chair, is in the process of addressing some of these issues. Among the specific initiatives now underway is the development and population of an enduring data base by the Aerospace Corporation to be used to assess the availability of key space professionals within industry, starting first with the Tier 1 members and then moving on to Tiers 2/3/4. We have tasked the National Security Space Office (NSSO) to work with senior leaders in both the government and industry to follow-up on key recommendations contained in many of the recent space studies. The "back to basics" acquisition approach emphasizes the commitment to recruit and train a strong space workforce.

General HAMEL. The current and projected U.S. space industrial base is sufficient to meet national security requirements for the next 15 years; but it needs our continued attention.

Due to the unique aspects of the space environment, space system components and parts often require uniquely designed, manufactured and tested products/practices not typical of terrestrial and aeronautical commercial and military systems. Consequently there are numerous niche suppliers whose business base is primarily space and subject to ups and downs of the overall space market. Several component and part suppliers have expressed concerns with their financial viability in the space market and the ability to provide a reasonable return on investment, as well as the ability to properly capitalize and invest in the development of advanced products for future systems.

The NSS community emphasizes Government investments (e.g., Title III; Mantech; S&T) to facilitate a strong and responsive industrial base with respect to technology and industrial needs; however, the available funds are limited. The Space Industrial Base Council, established, and chaired by DOD Executive Agent for Space, proactively identifies and addresses NSS industrial base concerns, and includes subcontractors and major vendors. NSS is establishing policies to address strategic technologies and sound source/make-or-buy analyses. Additionally, we emphasize to prime contractors their responsibility to enhance their own subcontractor management planning and surveillance.

With respect to people and skill base, the prime contractors are able to staff the necessary personnel to meet needs, but depth of experience is a challenge. However, they expressed concerns about the health of their subcontractors and major vendors and potential personnel lay-offs if future programs do not materialize. Challenges exist in the areas of systems and software engineering, but all of our contractors

have comprehensive programs in place to address this concern. They are actively working with universities to ensure key skills are available; using mentoring programs to ensure knowledge transfer, and retaining older workforce and employing knowledge transfer processes.

8. Senator SESSIONS. Dr. Sega and General Hamel, are contractors sufficiently motivated to get the job right?

Dr. SEGA. Our industry partners are motivated to engage in activities that not only ensure corporate, shareholders, and market expectations, but also to deliver world-class space systems that meet or exceed our requirements. The government motivates industry by using past performance as a factor in the source selection process and appropriately applying incentives and award fees during the life cycle of the program. The current emphasis on “back to basics” is re-energizing the space acquisition community to consider contractor incentives more vigorously early in program development.

General HAMEL. We are working to improve the Government/contractor relationship, via the type of contract used, so we sufficiently motivate the contractor to achieve total mission assurance. We have used Cost-Plus-Award-Fee (CPAF) contracts to motivate contractor performance. Unfortunately, we found CPAF contracts did not work in many instances because award fee often focused on processes rather than product. As a result, we are beginning to change our contract incentive structures by increasing the use of Cost-Plus-Incentive-Fee (CPIF) contracts and tying the amount of fee earned to measurable performance objectives. In addition to the use of objective performance incentives, we will ensure a rigorous linkage between the incentive fees earned by contractors and the performance assessments we input into the Contractor Performance Assessment Reporting System (CPARS). These performance assessments evaluate contractor past performance, a key factor in determining whether or not a contractor will be awarded future contracts. The strong linkage between objective contract performance incentives, past performance, and mission assurance is the best way to hold contractors accountable to consistently provide quality, on-time products and services to support our warfighters.

THE NEED FOR BETTER PROGRAM MANAGEMENT

9. Senator SESSIONS. General Hamel, how is the Air Force Space and Missiles Systems Center (SMC) assuring that program managers have the right expertise and experience to manage their programs?

General HAMEL. We are assuring program managers have the right expertise and experience to manage their programs by providing increased opportunity for education and training, creating a forum to exchange a body of knowledge, and utilizing the space professional database to identify/assign personnel with the right experience from across the Air Force.

SMC has developed a “schoolhouse” capability to provide space acquisition training that augments training available through the Defense Acquisition University, Air Force Institute of Technology, and other non-space specific sources. We are training our folks through the Space 100 and Space 200 course provided through the National Security Space Institute, as well. We have identified our best and brightest to participate in a Naval Post Graduate School systems engineering distance learning program.

In February 2006, Dr. Sega instituted a National Security Space Program Manager’s Conference to create a forum for program managers across space acquisition to share best practices and exchange lessons learned. This cross-flow of ideas and experiences is a great first step in creating a body of knowledge that our program managers can rely on to increase their expertise and bolster their own experiences.

Finally, Air Force Space Command is chartered with Space Professional Development. Part of this effort identified those military/civilians across the Air Force with space experience. We are now able to target acquisition professionals with maximum space experience to come to SMC. Recruiting these people raises the average experience level of our workforce as well as providing mentoring for our more junior space professionals.

10. Senator SESSIONS. General Hamel, is SMC attracting the best and brightest in the field?

General HAMEL. We are doing all we can to attract the best and the brightest by exploiting as many recruiting tools as we can, creating more opportunities for stable civilian positions, and making SMC a great place to work.

SMC is utilizing recruiting tools like the Presidential Management Fellows, Inter-governmental Personnel Act assignments, retired annuitants, and intern programs such as Palace Acquires and Copper Caps. We are also visiting Air Force professional developmental education venues like Air Command and Staff College and the Air Force Institute of Technology to advertise the great opportunities in space acquisition. Our system program directors are personally recruiting, making by-name requests for experienced and talented officers.

To create more opportunity for top-notch civilians to advance and to keep transitioning military at the Center, we are actively pursuing military to civilian position conversions. Additionally, we are exploring the potential to convert Assistance and Advisory Service jobs to civilian positions.

Finally, we are working hard to make SMC a great place to work so we can attract and retain the best and brightest. We have brand new facilities—the Schriever Space Complex—which offer a consolidated and modern work environment. We maximize the use of annual retention allowances and civilian hiring/compensation (e.g., bonuses, locality, housing, etc.) to offset the higher cost of living in the Los Angeles area.

11. Senator SESSIONS. General Hamel, do SMC program managers have enough control over resources and decisions to be held accountable for meeting cost, schedule, and performance goals?

General HAMEL. Our program managers do have enough control over resources and decisions to be held accountable for meeting cost, schedule, and performance goals; but we have to make sure we don't commit to more than we can deliver when setting program requirements, strategies, plans and goals.

We capture all previous acquisition results/lessons learned during our Acquisition Review Processes (i.e. Strategy Review, Source Selections, Program Reviews, Proposal Developments) and incorporate them into subsequent acquisitions. In doing so we attempt to ensure cost realism, create conservative schedules, mature requirements, and solid risk management/mitigation practices and create balanced program oversight. We collect and distribute, in conjunction with the Aerospace Corporation, management watch list items during pre-award activities and Independent Program Assessments. We evaluate accuracy of cost estimates, planning for integration/interfaces, software complexity, SPO staffing, adherence to proven policies and processes, and test rigor. SMC incorporates, across the portfolio, Defense Acquisition Performance Assessment recommendations and USECAF block/incremental acquisition approach, Lean Initiatives, and SMART OPS 21 recommendations to ensure we set our programs and program managers up for success.

12. Senator SESSIONS. General Hamel, in what ways can you, as Commander of SMC, instill and sustain tenure and accountability of your program managers?

General HAMEL. Space and Missile Systems Center has programs underway to recruit, attract, retain, reward, and better educate/train the space acquisition workforce. Specifically, we have extended tour lengths for acquisition personnel to 4 years, we actively recruit people with substantial expertise in space development and ensure stability of our people in key program leadership positions. We are also reinvigorating processes and competencies in core functions—systems engineering, cost/pricing, test planning and execution, program and technical reviews, scheduling, mission assurance—to improve our program managers' tool sets and bring consistency and predictability back into space acquisitions. Extensive benchmarking across the space portfolio and a newly established National Security Space Program Managers Conference are providing our program managers forums for sharing lessons learned and reinvigorating capabilities via best practices. I've also focused on dialogue between acquirers and warfighters to help us look beyond individual programs and consider mission area effects. Making program managers responsible for this "horizontal integration" empowers them to look for opportunities for synergies, multiplier effects, and cost avoidances. All these efforts, aimed to help our program managers be successful, are vital both to reinvigorating space acquisition/innovation and to sustaining tenure/accountability in our space professional.

13. Senator SESSIONS. General Hamel, how does SMC gain early knowledge about impending problems in acquisition programs?

General HAMEL. We've put several tools in place to help us gain early knowledge about impending problems on our programs. One of the most important tools are technical Program Management Reviews to focus on changes in cost, schedule, and technical baselines, as well as managing realized risks. We have been doing this for about a year now, and we review one program each week, which allows me and my key functional experts to see each program in detail three to four times per year—

greatly increasing our situational awareness. As the reviews mature we are working on making them more metrics-based to help us identify and address problems in our “headlights” rather than after they develop.

We also rely heavily on our Aerospace Corporation partners. Each week, Aerospace briefs SMC senior leadership and program directors on an overarching “watch list.” The “watch list” includes both program-specific and cross-cutting risks that Aerospace helps us track and mitigate.

Another “early warning” area that we are committed to improving is earned value management. Hand-in-hand with reinvigorating our cost estimating function, we are working to make earned value management a viable program management tool. SMC now has earned value experts on staff to provide education and assistance to the program offices. We’ve also teamed more tightly with the Defense Contract Management Agency to ensure that our industry partners earned value management systems are in-place, certified, and being utilized to track progress.

14. Senator SESSIONS. General Hamel, can you describe what is currently being done and what shortcomings remain in estimating costs for space systems?

General HAMEL. I have centralized cost estimating and assessment at SMC by creating a new Cost Analysis Division within my Financial Management Directorate. This organizational structure provides for independent reviews and a center of expertise for consistent cost analysis throughout SMC. Updated Program Office Estimates (POEs) are required at each major milestone. The new centralized Cost Division executes independent assessments of these POEs. In addition, I direct Independent Cost Assessments (ICAs) to be conducted from time to time on specific areas/programs of concern. These ICAs are also led by the new Center Cost Division, teaming at times with AFCAA and the OSD CAIG. In addition, we have instituted an IPT arrangement with AFCAA, NRO, and Navy Space programs to share best practices within the cost communities.

We have not completely restored our organic cost expertise—this will take some time—with robust recruiting and training—to fix completely. Also, we continue to work to improve the fidelity of the data in our cost models. My Cost IPT is working more closely with industry to improve our data collection efforts but this, again, will take time as well as resources to remedy.

15. Senator SESSIONS. Ms. Chaplain, according to the Government Accountability Office’s (GAO) recent survey, what are the top obstacles to achieving program success from the point of view of program managers?

Ms. CHAPLAIN. As part of a 2005 review¹ on program management best practices, we surveyed DOD’s major weapon program managers, including some managing space programs, who cited the following as “top” obstacles to achieving successful outcomes in an open ended question:

- funding instability (about 36 percent),
- requirements instability (13 percent),
- staffing problems (8 percent),
- excessive oversight (7 percent), and
- inexperienced leadership (7 percent).

Although the majority of respondents to our survey believed that the initial baselines of their programs were reasonable, a significant group, about 24 percent, responded that their program parameters were not reasonable at the start, and 45 program managers responded that their program had been rebaselined one or more times for cost and schedule increases. In addition, 18 percent said one or more key technologies fell below best practice standards for maturity.

Our reviews of space programs are consistent with these views—we have found technologies to be immature at program start for major space programs. Further, in delving deeper into the root causes behind these problems, we have found that competition for funding has incentivized programs to produce optimistic cost and schedule estimates, over promise on capability, suppress bad news, and forsake the opportunity to identify potentially better alternatives. In addition, because DOD starts more weapons programs than it can afford, it invariably finds itself in the position of having to shift funds to sustain programs—often to the point of undermining well-performing programs to pay for poorly performing ones. We also have found that DOD starts its space programs too early, that is, before it has assurance that the capabilities it is pursuing can be achieved within available resources (time, money, technology, people, etc.) and time constraints, and it allows new require-

¹ GAO, Best Practices: Better Support of Weapon System Program Managers Needed to Improve Outcomes, GAO-06-110 (Washington, DC: Nov. 30, 2005).

ments to be added well into the acquisition phase, a course of action that can further stretch technology challenges. This is encouraged by the funding process, as acquisition programs tend to attract the majority of research, development, test, and evaluation (RDT&E) dollars. Many officials working within the space community agreed that these were key underlying causes of acquisition problems during a review we conducted last year.² In addition, officials we spoke with also cited pressures resulting from having a diverse array of officials and organizations involved with the space acquisition process, tensions between the science and technology (S&T) and acquisition communities as to who is better suited to translate technology concepts into reality, pressures resulting from short tenures among staff critical to achieving acquisition success, and difficulties in overseeing contractors.

16. Senator SESSIONS. Ms. Chaplain, do you believe the Air Force is addressing these obstacles?

Ms. CHAPLAIN. The Air Force has recently taken steps to put its Transformational Satellite Communications System (TSAT) program on a more executable track by reducing its expectations in the level of sophistication for the first two satellites so that it can meet its schedule goals. It is also holding off entering product development of the first increment until critical technologies are proven. If the Air Force adheres to this commitment for TSAT and applies it to Space Radar, as it has also informally committed to do, then it would be addressing some of the obstacles noted above. For example, it would reduce the risk of funding instability since cost estimates would be more realistic. In addition, the Air Force has committed to estimating cost and funding new acquisitions to an 80-percent confidence level, strengthening systems engineering, and strengthening the acquisition workforce. For some specific programs, the Air Force has applied additional mechanisms to regulate requirements. These actions could also remove obstacles, if effectively implemented.

However, as we testified, such actions should be accompanied by an investment strategy for space, and ultimately DOD's entire weapons portfolio, to separate wants from needs and to alleviate longstanding pressures associated with competition within DOD to win funding. DOD could also instill the best practices it is now embracing into its space acquisition policy. In addition, we have recommended that DOD, as a whole, take steps to hold people and programs accountable when best practices are not pursued. This will require DOD to empower program managers to make decisions related to funding, staffing, and moving into subsequent phases and to match program manager tenure with delivery of a product. It may also require DOD to tailor career paths and performance management systems to provide incentives for longer tenures. By embracing a model that incorporates all these elements, DOD can achieve better outcomes for its space programs. By not doing so, there will still be incentives and allowances to overpromise capability, underestimate cost and schedule, and to start programs prematurely, which, in turn, can eventually undo other improvement efforts.

SATELLITE COMMUNICATIONS

17. Senator SESSIONS. General Chilton, as DOD's operational manager for satellite communications, U.S. Strategic Command (STRATCOM) plays a lead role in coordinating the use of both military satellite communications and leased commercial satellite communications assets. What steps could we take to better use the available commercial satellite fleets?

General CHILTON. DOD is currently conducting an analysis of the commercial satellite procurement process which will result in specific recommendations to improve DOD's strategic partnership with the commercial satellite industry. However, providing centralized funding would enable long-term global procurement of bulk commercial satellite bandwidth. Such contracts could include provisions to ensure rapid redeployment and resizing of bandwidth as mission requirements change. Long-term bulk procurements will allow DOD to develop long-term relationships with industry and leverage the cost benefits of being a high-priority, high-volume, high-value customer. Any centralized funding plan must provide for a means to scale the capabilities of DOD gateways to meet warfighter needs and include provisions for satellite network planning, management, and control.

² GAO, Defense Acquisitions: Incentives and Pressures That Drive Problems Affecting Satellite and Related Acquisitions, GAO-05-570R (Washington, DC: June 23, 2005).

18. Senator SESSIONS. General Chilton, what additional tools does STRATCOM need to improve the acquisition and planning process for using commercial satellite capacity?

General CHILTON. The DOD has designated the Defense Information Systems Agency (DISA) as the acquisition and planning agent for commercial satellite bandwidth. To realize improved commercial satellite service, DISA requires centralized funding to acquire, manage, plan, monitor, and assess the utilization of leased commercial bandwidth. In addition to leased bandwidth, this effort would require the following tools: (1) a Bandwidth Management and Scheduling Tool; (2) a Local and Remote Terminal Modeling Tool; (3) a Specific Real-Time Remote Spectrum Monitoring Capability Tool; (4) a Real-time Assessment Tool for determining Reserve and unused satellite bandwidth; and (5) a Schedule Mission Planning Tool for military and commercial satellite resources.

SPACE CAPABILITIES FOR THE WARFIGHTER

19. Senator SESSIONS. General Chilton, what are the warfighter's priorities with respect to needed improvements to our space capabilities?

General CHILTON. Warfighter priorities include capability enhancements to:

- Space Situational Awareness (SSA). SSA is the Space Control mission foundation, enabling an understanding of the space environment (rapid acquisition and fielding of capabilities that can detect, geolocate, and characterize threats to space systems will provide the unambiguous distinction between hostile action and natural environmental space effects).
- Without adequate SSA there is increased risk of on-orbit collision, unnecessary orbital maneuvers, ineffective overflight warning, sluggish attack/anomaly detection/resolution, unfocused intelligence collection, lack of timely predictive battlespace awareness, and ineffective space control prevention/negation operations.
- Responsive access to space (a new business model, next generation boosters and more efficient launch operations, launch-on-demand and store-on-orbit concept development).
- Technological advances in miniaturization, materials, production, and automation (make payloads smaller with more on each booster and reducing vulnerability to loss).
- Automation and integration of space command and control capabilities.
- Integration of all current and future SSA capabilities into a common user defined operational picture.

20. Senator SESSIONS. Admiral Deutsch and General Hamel, would you care to add anything from the perspective of the Navy and Air Force?

Admiral DEUTSCH. The Navy is interested in space as a key part of FORCEnet. Our priority is to integrate space capabilities, particularly military satellite communications: intelligence, surveillance, and reconnaissance (ISR); environmental sensing and position, navigation, and timing (PNT) throughout the naval force to make space tactically relevant. Wide-area surveillance capabilities, both active and passive, as well as robust communications, including comms-on-the-move, will support tactical strike, anti-submarine warfare, mine warfare, special operations, Maritime Domain Awareness (MDA), and other high priority mission areas. An emerging priority, which cuts across all warfare areas, is data exfiltration (e.g. the capability to move data from distributed sensors to command and control (C2) nodes).

The Navy also wants to see improvements in Space Situational Awareness (SSA) and protection. The Navy needs greater fidelity in the Common Operational Picture (COP) including SSA. Integrating SSA data into the COP is crucial to dynamically adapting to changes in space system availability (e.g. ISR, SATCOM, etc.) to maintain warfighting effectiveness.

Keeping with the objective to maximize space support to the Navy warfighter, we are interested in Operationally Responsive Space (ORS) because of its potential to provide a more affordable way to get beyond the line of sight of communication capabilities and rapid-reaction ISR sensors, on orbit, in a tactically relevant timeframe to respond to asymmetric challenges and hedge against uncertainty.

General HAMEL. While there are many areas for improvement in our space capabilities, I would defer to our users to determine warfighter's priorities. Faster, better, cheaper, persistent, and more reliable are always desirable—responsiveness is key. We're very proud that we're able to launch rockets into space, but the fact remains, simply launching hardware to space does nothing to enable America's joint warfighters. It's only after the systems are switched-on, checked-out, and given

thumbs-up that the payoff begins. The mission of the Space and Missile Systems Center is to deliver operationally responsive systems to the warfighter and our Nation. Delivering these integrated warfighting effects and capabilities is part and parcel to our existence. By enabling and being responsive to the needs of warfighters we contribute to the Air Force's primary focus: winning the global war on terror. Through innovative use of heritage systems and evolving technologies, we remain committed to providing the world's finest space capabilities to the world's finest warfighters. To that end, it's incumbent on us to remain receptive to the needs of combatant commanders leveraging our resources to satisfy their requirements.

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

EVOLVED EXPENDABLE LAUNCH VEHICLE

21. Senator BILL NELSON. Dr. Segal and General Hamel, the next batch of Evolved Expendable Launch Vehicles (EELV) launches to be put on contract, the Buy III has been delayed, as I understand it, largely as a result of the delay in Federal Trade Commission (FTC) approval of the United Launch Alliance. Are there any other factors in the delay and when will the Buy III launches be put on contract?

Dr. SEGAL. The timing in the Buy III EELV Launch Services (ELS) contract awards is not related to the FTC's approval of ULA. The Buy III contracts will be awarded regardless of FTC's approval or disapproval of the ULA proposal. Implementing the new EELV acquisition strategy involves moving from a commercial-based procurement program to a more traditional government procurement program and has been challenging. The contracts require a government standard accounting system that was not used by either contractor under the previous commercial services contracts. All Buy III contracts are being audited by the Defense Contract Audit Agency (DCAA) to ensure full compliance in this transition. We expect to award our Buy III ELS contracts in the near future as these audits are completed.

General HAMEL. The delay in the Buy III contract awards are not related to the FTC's approval of United Launch Alliance (ULA). The Buy III contracts must be awarded regardless of ULA's approval or disapproval by the FTC. The delays in Buy III are due to the complexity of implementing the new EELV acquisition strategy. Specifically, moving from a commercial based procurement program to a more traditional government procurement program has been extremely challenging. The contracts require a government standard cost accounting system that was not used by either contractor under the previous commercial services contracts. All Buy III contracts are being audited by the Defense Contract Audit Agency (DCAA) to ensure full compliance with this requirement. We expect to continue awarding our Buy III contracts over the next few months as these audits are completed.

22. Senator BILL NELSON. Dr. Segal and General Hamel, the Fiscal Year 2006 Defense Appropriations Act Statement of Managers language directs the Air Force to eliminate multi-year allocations, pre-awards, and block buys from Buy III. Could you explain how the Air Force plans to implement Buy III and could you discuss the issues that the Appropriations Committee was attempting to address in its language?

Dr. SEGAL. The Air Force is implementing Buy III in compliance with the fiscal year 2006 congressional language. We will award the EELV launch capability contracts for a 2-year period and will award on an annual basis, without multiyear allocation, pre-awards and block buys. The annual call for proposals for EELV launch services will allow any potential EELV certified provider the opportunity to compete in the program.

General HAMEL. The Air Force is fully compliant with the Fiscal Year 2006 DOD Appropriations Conference Report. Per the conference report, the Air Force fully intends to assign and procure the remaining 19 Buy III EELV launch services on an annual basis. This means that every year through the projected 4 years of Buy III launches, the USAF will assign and procure only the launch services that must be ordered in the next fiscal year for launch 2 years later. No additional action is required to comply with the conferees' language because the 21 Apr 05 EELV Launch Services Request for Proposal notified the contractors that "The Government Reserves the right to award, reallocate, and/or reschedule these unawarded launch service missions, or to not make any launch service awards."

23. Senator BILL NELSON. Dr. Segal and General Hamel, how far in advance does a launch vehicle have to be assigned to a particular satellite or satellite program and why?

Dr. SEGA. The EELV program funds the launch service 2 years prior to the launch date. In some cases, with a very complex satellite type that has not been previously integrated, the initial satellite integration work is begun prior to this 2-year period. However, the final allocation is done on an annual basis 2 years prior to launch.

General HAMEL. The EELV program funds the launch service 2 years prior to the launch date. In some cases, with a new satellite type that has not previously been integrated, the initial satellite integration work is begun prior to this 2-year period. The final allocation is done at least 2 years prior to launch to allow sufficient time to fully integrate the spacecraft and the chosen launch vehicle.

24. Senator BILL NELSON. Dr. Sega and General Hamel, will the United Launch Alliance result in a more flexible approach to launch vehicle assignments?

Dr. SEGA. We believe it will. The efficiencies gained in engineering, manufacturing, and operations under the United Launch Alliance joint venture will continue EELV's progress to obtain a standard interface to the satellites. Launch vehicle assignment will continue, however, to be assigned 2 years prior to launch.

General HAMEL. Yes, we believe it will. The efficiencies gained in engineering, manufacturing, and operations under the United Launch Alliance joint venture will continue EELV's drive for a standard interface to the satellites. However, launch vehicle assignment will continue to be assigned 2 years prior to launch for the foreseeable future.

SPACE ACQUISITION POLICY

25. Senator BILL NELSON. Ms. Chaplain, first I want to thank GAO for its excellent discussion of the problems and progress in space acquisition programs. That some programs have exceeded 100 percent cost growth and have been delayed for more than 6 years is an extraordinarily troubling circumstance. On page 4 of your statement there is a chart that shows the difference between initial and most recent cost estimates for space programs. The difference is on the order of more than \$2 billion per year. GAO highlights three key issues that I would like to walk through.

The first problem is that DOD starts more space and weapons programs that it can afford, "which pressures programs to underestimate costs and over promise capabilities." Can you provide a few examples of this problem in space programs and if and how the problem is being addressed?

Ms. CHAPLAIN. Actual costs for nearly every major space acquisition we review each year as part of our annual weapon system assessment have greatly exceeded earlier estimates—a clear indication that programs consistently underestimate costs. For example, the Space Based Infrared System (SBIRS)-High cost estimate climbed from about \$4 billion as of October 1996 to over \$10 billion in September 2005, and costs are expected to increase further. Estimated costs for the Evolved Expendable Launch Vehicle (EELV) program have climbed from about \$15 billion in October 1998 to \$27 billion in August 2005 with 43 fewer launches to be purchased than anticipated. Estimated costs for the Advanced Extremely High Frequency Satellite program (AEHF) increased from \$5.6 billion as of October 2001 to \$6.2 billion as of August 2005, with quantities decreasing from five to three satellites. Estimated costs for the National Polar-orbiting Operational Environmental Satellite System (NPOESS) grew from \$5.9 billion in August 2002 to nearly \$8 billion in September 2005. Our past reports have also identified cases where programs have overpromised capabilities. For example, the SBIRS-Low program started under the assumption that the satellites would be able to detect and track multiple objects and differentiate a threatening warhead from decoys, even though that technology challenge was exceedingly high. In fact, the program was never able to achieve this capability. It was eventually shutdown in the face of cost and schedule overruns that came with addressing technology challenges. The SBIRS-High program began with the assumption that there would be four satellites in geosynchronous orbit, but more than 10 years later, DOD plans to reduce the number of satellites it will procure and still does not have the assurance it needs that the missile detection capability can be achieved in time to replace the existing detection system. In addition, DOD has initiated efforts to develop a parallel competing capability with the SBIRS-High program. Similarly, the NPOESS program is now considering dropping some of its planned capability because of technology and design-related challenges.

DOD has been taking actions to improve cost estimating and we are in the process of assessing these actions. As mentioned above, for example, it has committed to estimating cost and funding new acquisitions to an 80-percent confidence level. In addition, the Air Force is requiring the use of independent cost estimates—rather than estimates produced by a program office or a contractor. It is also committed

to strengthening its cost-estimating capabilities—in terms of people, methodologies, and tools. In regard to the issue of overpromising capability, the Air Force has deferred pursuing some of its more ambitious capabilities on its TSAT program, so that the program can be better positioned to meet its schedule. We do not know at this point whether it will be doing the same for its new Space Radar program. As we underscored in our testimony, it is important that these and other individual actions be made within a framework of broader, systemic improvements to DOD's overall acquisition process, the acquisition workforce, and an overall investment strategy.

26. Senator BILL NELSON. Ms. Chaplain, the second problem is that DOD “starts its space programs too early, that is, before it is sure the capabilities it is pursuing can be achieved within available resources and time constraints.” Can you provide a few examples of this problem in space programs and if and how the problem is being addressed?

Ms. CHAPLAIN. Many of our annual reviews of major space acquisitions show that programs have started with relatively low levels of technology maturity—meaning DOD does not have assurance that the technologies can work as intended. This includes, AEHF, NPOESS, SBIRS-High, and SBIRS-Low—now known as the Space Tracking and Surveillance System. Exceptions include the Navy's Mobile User Objective System (MUOS) (though the program later added two additional technologies that did not meet best practices standards for maturity) and the Global Positioning System Block IIF. At times, we have found that key sensors to be included in new satellites were not fully tested, or even prototyped, before being included in a program. In other cases, technologies used to support the health of the overall satellite, such as cooling systems, were immature. In other cases, software needs were vastly underestimated. In the case of AEHF, technical resources to support security needs were underestimated.

Many programs we have studied felt the need to start the acquisition process before such needs were better understood because acquisition programs tend to attract more funding than science and technology efforts. In addition, in the case of space, programs have historically attempted to satisfy all requirements in a single step, regardless of the design challenge or the maturity of the technologies to achieve the full capability. While this is partly attributable to a desire to speed delivery of capability, it has perversely slowed down programs, since programs were at increased risk of facing costly and disruptive technical and design problems.

As noted previously, DOD has committed to delay the development of one new major space program—TSAT—until technology needs are better understood. It has also committed to deliver new space-based capabilities in an incremental fashion so that acquisition efforts can be more executable and the science and technology base can be more engaged in major space programs. It has not taken such action yet on other new programs, notably Space Radar, though it has informally committed to. In addition, DOD's space acquisition policy still allows major acquisitions to begin without demonstrating that technology can work as intended.

27. Senator BILL NELSON. Ms. Chaplain, the third issue is the DOD has “allowed new requirements to be added well into the acquisition phase.” I would also add that sometimes the original requirements may be unrealistic or unaffordable and that this too may be part of the problem. Can you provide a few examples of the requirements problem in space programs and if and how the problem is being addressed?

Ms. CHAPLAIN. Our past reports have pointed to requirements setting problems in the AEHF, NPOESS, and SBIRS-High programs. In the case of SBIRS-High, we pointed to problems related to not adequately defining requirements upfront. These were further detailed in subsequent DOD studies, including those by the SBIRS-High Independent Review Team and the Defense Science Board. Both noted that the acquisition approach the Air Force was following, known as Total System Performance Responsibility, placed too much responsibility on the part of the contractor to negotiate requirements, and that the process eventually broke down. In the case of NPOESS, we reported in the early phases of the program that the Air Force and the National Oceanic and Atmospheric Administration had difficulty resolving diverging requirements. In the case of AEHF, we reported that DOD substantially and frequently altered requirements and design in the early phases of the program. While considered necessary, some changes increased costs by hundreds of millions of dollars and caused scheduling delays on a program that DOD was trying to accelerate in order to address a potential capability gap. DOD has since rejected the acquisition approaches that led to requirements-setting problems on both SBIRS-High and AEHF. It has also instituted control mechanisms to regulate requirements on

SBIRS-High. In our testimony, we noted that DOD could take further steps to strengthen requirements setting by implementing processes and policies, as needed, which stabilize requirements for acquisitions, like NPOESS, that are being shared with other agencies.

We have also reported on programs that took on unrealistic or potentially unaffordable requirements. The SBIRS-Low program's pursuit of discrimination capability is an older example of such a program. More recently, we have pointed to affordability and feasibility issues related to Space Radar and the TSAT programs, which together, have been preliminarily estimated to cost about \$40 billion. Specifically, we have stated that DOD was planning to start these acquisitions even when many of their critical technologies were still immature, and it was pursuing a highly ambitious path in terms of the technology push. Given that these systems were among the most complex programs ever undertaken for space, they were being counted on to enable wider DOD transformation efforts, and DOD was already contending with highly problematic space efforts, we believed that DOD could not afford to pursue such risky approaches for TSAT and Space Radar. As noted earlier, DOD has taken steps to ensure it is pursuing realistic requirements for TSAT, and it has informally committed to do the same for Space Radar.

28. Senator BILL NELSON. General Hamel, the Young Panel, which reviewed space acquisition programs, also identified the manner in which space programs are funded as a reason for cost growth. The Young Panel believed that the programs should have a sufficient contingency to address small issues, while they are still small, and that programs should be funded at the 80 percent confidence level. Which Air Force programs are funded at the 80 percent level?

General HAMEL. TSAT is the only program in my portfolio currently funded at the 80 percent confidence level. In general, we work very hard in the Air Force to preserve appropriate management reserve for our program managers—depending on the program's level of risk, relative priority, and the pool of available funding. Funding all programs to an 80 percent confidence level would be extremely challenging.

29. Senator BILL NELSON. Dr. Segal, do you plan to make this a requirement for all space acquisition programs?

Dr. SEGAL. We will fund programs at an increased confidence level based on our assessment of the program's risk. For example, the TSAT program was funded to a higher confidence level in the fiscal year 2007 President's budget request.

30. Senator BILL NELSON. Dr. Segal, in your testimony you state that you want to adopt a "back to basics" approach to space acquisition and you talk about four distinct stages. The third stage is where the technology is matured "until we are confident it will work reliably in space." Does this include full systems testing?

Dr. SEGAL. Our intent is that when we enter stage four in the acquisition process (Systems Production), we will have reduced the technical risk to an acceptable level and the cost and schedule risk will have fallen commensurately. Stage four is when full system testing will occur. For the most part, entering the fourth stage from the third stage (Systems Development) with TRL-6 technologies is sufficient to reduce and manage program risk.

31. Senator BILL NELSON. Dr. Segal, is the integration issue resolved?

Dr. SEGAL. For space systems there is little opportunity for a test flight to identify and resolve problems that arise during assembly of the asset. However, we are taking steps to minimize integration risk. First, the incorporation of mature technology and good systems engineering will reduce risk in production of space systems. For example, manufacturing and integration of proven technologies allows more controlled risk management. Systems that can interface with common test equipment will simplify and speed up qualification testing. Second, we are putting a greater emphasis on industry standards for space components. Space certified parts and components that are tested and certified as space-worthy can be confidently used without extensive follow-on testing and should be easier to integrate into space-rated subsystems.

SPACE RADAR

32. Senator BILL NELSON. Dr. Segal, General Chilton, General Hamel, Admiral Deutsch, and Ms. Chaplain, is there a clear definition of each Technical Readiness Level (TRL) that all of you agree on and that exists in writing and that clearly applies to space programs?

Dr. SEGA. The Defense Acquisition Guidebook, table 10.5.2.1, defines the TRLs as shown in the table below.

Technology Readiness Level	Description	Technology Readiness Level	Description
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.	6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.	7. System prototype demonstration in an operational environment.	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology.	8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system.	9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment.		

General CHILTON. The Defense Acquisition Guidebook, table 10.5.2.1, defines Technology Readiness Levels. There is common agreement that for a satellite program, the "operational environment" referenced in the definition of TRL 7 is space (i.e., on orbit).

General HAMEL. There are common descriptions of Technology Readiness Levels in the Defense Acquisition Guidebook, but they are overarching for all technologies—not specific to space technologies. There is common agreement that the "operational environment" in TRL 7 is "on-orbit" for space systems.

For reference, the following Technology Readiness Levels apply:

TRL 1: Basic principles observed and reported.

TRL 2: Technology concept and/or application formulated.

TRL 3: Analytical and experimental critical function and/or characteristic proof-of-concept.

TRL 4: Component and/or breadboard validation in laboratory environment.

TRL 5: Component and/or breadboard validation in relevant environment.

TRL 6: System/subsystem model or prototype demonstration in a relevant environment (ground or space).

TRL 7: System prototype demonstration in an operational environment.

TRL 8: Actual system completed and "flight qualified" through test and demonstration.

TRL 9: Actual system “flight proven” through successful mission operations.

Admiral DEUTSCH. The National Security Space Acquisition Policy (0301, 27 December 2004) uses the definitions of Technology Readiness Levels in the Department of Defense Instruction (DODI) 5000.2 Acquisition System Guidebook, which it specifically references. Per the DODI, it applies to “The Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff (Joint Staff), the Combatant Commands, the Office of the Inspector General of the Department of Defense, the Defense Agencies, DOD Field Activities, and all other organizational entities within the Department of Defense (hereafter referred to collectively as “the DOD components”).

While TRL definitions are clear, they are subject to interpretation in the context of assessing technology maturity and design risk.

Technology Readiness Level	Description
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that they will work together. This is relatively “low fidelity” compared to the eventual system. Examples include integration of “ad hoc” hardware in the laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment. Examples include “high fidelity” laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment.
7. System prototype demonstration in an operational environment.	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.

Ms. CHAPLAIN. The National Aeronautics and Space Administration (NASA) developed the original ranking and definitions of technology maturity levels. GAO and DOD agree on the TRL definitions—in its reports, GAO continues to reference the TRL scale for assessing critical technologies from DOD's Interim Defense Acquisition Guidebook (app 6, dated October 30, 2002). However, for space system acquisitions, GAO and DOD have disagreements on what the TRLs should be at major decision points. According to our work on best practices, product development should be initiated after critical technologies have been incorporated into a system prototype and tested in an operational environment—meaning the cold-radiated vacuum of space. Our prior reports have recognized that space systems are uniquely difficult to test in a true operational environment. However, DOD has found ways to test sensors and other critical technologies on experimental satellites. Nonetheless, DOD continues to stand up formal space system acquisitions too early—before critical technologies have been tested in operational or relevant environments—that is, before DOD has assurance that the capabilities it is pursuing can be achieved. This causes DOD to extend technology invention to its acquisitions, which have reverberating effects and require large amounts of time and money to fix. In these cases,

DOD points to its National Security Space Acquisition Policy, which allows it to take such an approach—unlike DOD's acquisition policy for non-space acquisitions, where TRL 7 (testing in an operational environment) is preferred before product development is initiated (TRL 6 is required). As long as GAO continues to base its reviews of space programs on best practices and DOD continues to use the wide leeway afforded in its space acquisition policy regarding critical technologies and their maturity levels to initiate product development, GAO and DOD will continue to have disagreements in this area.

33. Senator BILL NELSON. Dr. Sega, General Chilton, General Hamel, Admiral Deutsch, and Ms. Chaplain, what is the difference between TRL 6 and 7 and what is the advantage or disadvantage of being at level 6 or 7 of the Conceptual Design Review (CDR)?

Dr. SEGA. TRL 6 refers to a representative model or prototype system that has been tested in a relevant environment. This relevant environment can be a high-fidelity laboratory (e.g. Thermal Vacuum Chamber) or a simulated environment. TRL 7 refers to a prototype similar to the operational system tested in the operational environment (i.e. on orbit). Traditionally, successful space programs have achieved TRL 6 by Critical Design Review through space qualification of components and selected subsystems.

General CHILTON. TRL 6 refers to a system/subsystem model or prototype demonstration in a relevant environment, such as a high fidelity laboratory or simulated operational environment. TRL 7 refers to a system prototype demonstration in an operational environment, in the case of space systems, in space, and represents a major step up from TRL 6. Because TRL 7 may only be properly achieved through test on orbit, most programs have not pursued TRL 7 by CDR.

General HAMEL. TRL Level 7 requires the demonstration of an actual system prototype in an operational environment, where as TRL level 6 is a representative model or prototype in a relevant environment. CDR is the primary review gate to assure the design is adequate to meet system performance needs before starting the manufacture of the system and its components. The advantage of a technology or technologies being at TRL level 7 at CDR is the increased degree of confidence the system solution will perform as intended in its application and environment.

The challenging aspect of space acquisition is that satellites cannot be proven in an operational environment until they are on orbit, so reaching TRL 7 at CDR is not practical. However, we have been successful in achieving TRL 6 (tested in a relevant environment) through space qualification of components and selected subsystems, and with prototype systems that represent the functional capability of the system.

Admiral DEUTSCH. The definitions for TRL 6 and 7 are provided. The main difference is that TRL 7 represents a capability that has been proven in an operational environment using a system prototype (near flight-like engineering design model).

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| 6. System/subsystem model or prototype demonstration in a relevant environment. | Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment. |
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GAO normally looks for a minimum of TRL 6 at CDR. The advantage of TRL 7 at CDR is that program risk has been further reduced, and cost and schedule information are more accurate.

Ms. CHAPLAIN. The main difference between TRL 6 and 7 is the testing environment. For TRL 6, the testing environment would be a laboratory or a simulated operational environment, and for TRL 7, the testing environment would be an operational environment—meaning in space. According to GAO's work on best practices, achieving a high level of technology maturity at program start is an important indicator of whether available resources in terms of knowledge, time, money, and capacity match the customer's requirements. In addition, the key measure for a successful critical design review (CDR) is when 90 percent of the design drawings have been submitted to manufacturing. When space programs reach CDR and TRLs are below 6, it is unlikely that a high percentage of design drawings would have been released to manufacturing, thereby increasing program risk at this juncture. Another key point to remember is that CDR is the point at which programs begin ordering long-lead parts to build the first few satellites. This investment in hardware is at risk if the technologies do not prove out to work as intended. Achieving TRL 6 or 7 by

CDR is a matter of risk—if the critical technologies in question are supremely important and have no space-based heritage, then it is warranted to test the technologies in space before proceeding through CDR. For TSAT, some critical technologies have a heritage of being tested or operated in space, and they are all slated to be at TRL 6 at the time of CDR—an approach that GAO did not fault.

34. Senator BILL NELSON. General Chilton, could you talk about the requirement for Space Radar, and how STRATCOM coordinates or interacts with the IC in identifying the requirements?

General CHILTON. STRATCOM has consistently identified and documented enhanced capabilities which would allow advanced threat tagging, tracking, and location. These capabilities have been documented through the DOD Readiness Reporting System (DRRS). The command utilizes Senior Warfighter Forums (SWARF) to identify, consolidate, and resolve combatant commander capability requirements, co-leading DOD working groups with the Under Secretary of Defense for Intelligence. STRATCOM advocates requirements for combatant commanders through the Intelligence Technologies Investment Program (ITIP).

STRATCOM's participation in requirements development for the Space Radar system takes place at the Space Radar Executive Steering Group (ESG), Executive Committee (EXCOM), and Requirements and Capabilities Group (RCG). Representation at each level includes DOD and ODNI participants who come together in support of the 13 Jan 05 Joint Secretary of Defense—Director of Central Intelligence memorandum in which they committed to pursue a Space Radar capability that “will satisfy the needs of both the national Intelligence Community customers and the joint warfighters; fully integrate with other national and joint intelligence, surveillance, and reconnaissance capabilities.” Additionally, STRATCOM in coordination with the RCG membership, is planning experimentation and demonstrations to develop a responsive Concept of Operations.

35. Senator BILL NELSON. Dr. Sega, General Chilton, and General Hamel, an additional concern about Space Radar is how much will it cost. The Space Radar, if successful, would provide substantial new capability to find, identify, track, and monitor moving and stationary targets. What is the best ballpark cost of the system—there have been estimates as high as \$40 billion—can we afford this capability? Is there any alternative?

Dr. SEGA. We are developing the program in measured steps, in order to reduce early program risks. Results of this work will include a total estimated cost for nine satellites in low earth orbit (plus one spare) and investment in the ground segment. We continue to work on an updated cost estimate of the Government Reference Architecture (GRA) as it is refined by the JROC and the MRB processes. The initial program office estimate falls in the range of \$20–\$25 billion.

Several studies in the past have looked at alternatives for a Space Radar capability, some included participation of the IC. Results of these studies concluded that a single low earth orbit constellation for national and military users was the most cost-effective solution, and the planned Electronically Scanned Array technology provided the best cost benefit tradeoff.

General CHILTON. STRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General HAMEL. The Space Radar program is not within my portfolio and, therefore, it is inappropriate for me to comment.

36. Senator BILL NELSON. Dr. Sega, the Space Radar Integrated Program Office has improved the overall management of the program. I remain concerned, however, that all potential users of Space Radar have not committed to utilize the program and to jointly fund the program. What is the process to have this program jointly funded and utilized?

Dr. SEGA. All Space Radar stakeholders are jointly developing requirements and concept of operations (CONOPs). Recently, both the DOD and IC validated the ICD. In response to the validated ICD, we have identified a Government Reference Architecture which contains nine satellites in low earth orbit (plus one spare) and an interdependent ground capability which will interface with other space and airborne systems to support ISR horizontal integration.

TRANSFORMATIONAL COMMUNICATIONS SATELLITE

37. Senator BILL NELSON. Dr. Sega, General Chilton, General Hamel, and Ms. Chaplain, the TSAT program, though still very early in the process, appears to have begun to adopt some of the recommendations of the GAO as well as the Young Panel and is focusing on technology maturity. Integration of the satellite appears to be the next difficult step for the TSAT program. What plans are in place to ensure successful integration?

Dr. SEGA. Integration and testing is indeed a critical step forward. We are planning for it by incorporating lessons learned from other space programs and from independent voices. The restructured block-build TSAT is funded at a higher confidence level, providing added risk margins throughout the cost estimate for unforeseen problems that will be encountered in development and integration. Similarly, the program schedule has been adjusted to accommodate more measured progress, specifically to provide additional time for integration efforts. The block approach reduces integration risk by reducing critical technologies that need to be integrated into the satellites. Lessons learned from the integration efforts on the TSAT Block 1 satellites will be used to improve the integration effort on the TSAT Block 2 satellites.

General CHILTON. The TSAT Program Office has been organized with a Systems Engineering and Integration (SE&I) section to work the integration of the spacecraft contractor, the Mission Operations System contractor, and the terminal program offices. Overall system requirements documents are developed first. These system requirements documents drive the requirements documents for the spacecraft, operations system, and terminals that the contractors design to. Key events in the TSAT schedule include program reviews, where all TSAT components are examined to ensure interoperability with associated components and within the overall system.

General HAMEL. Integration and testing of subsystems and at the system level are indeed critical steps. We plan for it by incorporating lessons learned from other space programs and from independent voices. The restructured Block TSAT is funded at a higher confidence level, providing added risk margins throughout the cost estimate for unforeseen problems encountered in development and integration. Similarly, we adjusted the program schedule to a slower, more measured progress specifically to provide additional time for the engineering development and integration efforts. In itself, the block approach reduces integration risk by reducing the weight and capacity, and thus the complexity, of the initial satellites. We will capture lessons learned from the integration efforts on the Block 1 satellites and use them to improve the integration effort of the Block 2 satellites.

We have invested significantly in the key technology and systems for TSAT to reduce risk. Detailed engineering, design, and manufacturing of subsystems lie ahead.

Ms. CHAPLAIN. The TSAT program is taking several steps to ensure its integration efforts are successful. First, according to program officials, the plan is to demonstrate critical technologies at TRL 6 when key integration tests are conducted in fiscal year 2007. Second, the program plans to use the results of its first round of integration tests to refine the testing to be conducted during a second round of more comprehensive integration testing. Third, the program is conducting a series of independent tests to verify results of contractor testing as it incrementally builds toward the two main integration tests facing the program—tests of the Next Generation Processor Router and Optical Standards Validation Suite. The program office plans to have knowledge on how these two major subcomponents work to reduce risk by uncovering technical problems before awarding the space segment contract for the design and assembly of the satellites. Finally, the TSAT program also plans to assess the results of the main integration tests before making a decision to enter the production development phase.

38. Senator BILL NELSON. Ms. Chaplain, what actions would you recommend to the program managers to ensure successful integration?

Ms. CHAPLAIN. According to GAO's prior work on best practices, leading firms ensure that (1) the right validation events—tests, simulations, and other means for demonstrating product maturity—occur at the right times, (2) each validation event produces quality results, and (3) the knowledge gained from an event is used to improve the product. Fully disclosing the results of tests (from low-level brass board tests to the main integration tests) and documenting the actions taken to address shortcomings further validates product knowledge. It is imperative that problems are fully addressed before rushing efforts to begin the next round of testing. It is also important that program managers use the test and evaluation parameters originally established, and any changes should be fully disclosed along with the reasons for doing so. Finally, the program manager needs assurance that all testing

that has been done is reflective of the capabilities that the program is trying to deliver. Rigorous and sophisticated testing early and often will uncover problems when they are relatively easy and inexpensive to fix. Waiting too long to fully stress and test components will put the program in a risky position.

In preparing answers to your questions, we relied on our prior work on DOD's space acquisition policy, best practices in weapon system acquisitions, and our reviews of specific space acquisitions as well as DOD studies. In addition, for specific space systems development and cost growth, we relied on our annual assessment of selected major weapon programs. Because we relied on previously issued work, we did not obtain comments from DOD on a draft of this letter. We conducted our work from April 2006 through May 2006 in accordance with generally accepted government auditing standards.

39. Senator BILL NELSON. Dr. Sega, General Chilton, and General Hamel, I understand that the decision has been made to terminate the Advanced Extremely High Frequency (AEHF) program early, and substitute TSAT for the AEHF satellites 4 and 5. What is the last date to buy the fourth AEHF satellite without a production break if there is an issue with the first TSAT?

Dr. SEGA. To avoid a production break, advanced procurement for AEHF 4 needed to be included in the fiscal year 2006 appropriated budget. No advanced procurement money was included.

General CHILTON. The last date to program for the fourth AEHF satellite was in the fiscal year 2006 program objectives memoranda. There is already a production break for making a fourth AEHF satellite.

General HAMEL. To avoid a production break AEHF 4 required advanced procurement funding in fiscal year 2006 and production funding in fiscal year 2007. The advanced procurement funding was not included in the Fiscal Year 2006 Appropriations Bill.

NATIONAL POLAR ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM

40. Senator BILL NELSON. Dr. Sega and General Hamel, the NPOESS is a joint NASA, DOD, and NOAA program with the funding equally divided between the Department of Commerce and the DOD. There are serious problems with several of the sensor development programs, which resulted in a Nunn-McCurdy breach in November. Program certification, required as result of the breach, is due in June. Do you believe that the program will be recertified, and that funding for the program will continue to be split equally between DOD and Commerce?

Dr. SEGA. All three agencies—DOD, Commerce, and NASA—actively participated in the Office of the Secretary of Defense-led Nunn-McCurdy certification process. The NPOESS program was recertified on June 5, 2006, by the Under Secretary of Defense for Acquisition, Technology, and Logistics. Funding for the program will continue to be split equally between DOD and Commerce.

General HAMEL. The NPOESS program is not within my portfolio and, therefore, it is inappropriate for me to comment.

SPACE-BASED INFRARED SYSTEM-HIGH

41. Senator BILL NELSON. General Hamel, could you please provide an update on the status of the Geosynchronous Earth Orbit (GEO) segment of the SBIRS-High system, and the new contracting approach? I note that the two High Earth Orbit (HEO) sensors have been delivered.

General HAMEL. We continue to make good progress on the GEO segment. The GEO 1 payload completed its first thermal-vacuum test in January 2006 and the hardware continues testing roughly running on schedule. GEO 1 spacecraft functional test officially started on 18 April 2006 with the first Safe-to-Mate activities at the Lockheed Martin facility in Sunnyvale, California. Other GEO 1 hardware (star trackers, communication and power system components, etc.) are also making progress in multiple locations. The various flight software products are also progressing, but exhibit the typical first-time development/integration challenges. Status of these efforts is a continuing focus item at all the senior reviews and several independent assessments have been conducted. However, all discrepancies currently identified can be resolved.

As a result of the December 2005 certification decision, the SBIRS program was restructured and is authorized to complete the current contract (2 HEO, 2 GEO, and all associated ground systems). The production decision, in fiscal year 2007, for procurement of an additional GEO satellite (GEO 3) is predicated on confidence the

first GEO satellite can perform its mission. If USD(AT&L) directs the procurement of a SBIRS GEO 3, then the implementing details, i.e. contract type, profit, incentives, required contractor reports, incorporation of military standards and specifications, etc., will be finalized.

An additional result of the December 2005 certification decision was an USD(AT&L) direction to establish an alternative program capability to ensure that the Nation's missile warning capability is sustained. The Acquisition Decision Memorandum stated that "the parallel program will pursue an approach with acceptable technical risk that offers DSP-like missile warning capability and can ensure a launch availability date of fiscal year 2015." This program will start in fiscal year 2006 using warfighter rapid acquisition funds; the fiscal year 2007 President's budget includes \$103 million for technology development for the parallel program.

As you noted, both HEO sensor payloads were delivered for integration on the host spacecraft. The sensitivity of the delivered payloads is greater than required and is expected to provide a significant increase in capability to the warfighter.

42. Senator BILL NELSON. Dr. Sega and General Chilton, the SBIRS-High program is a companion program to the Space Tracking and Surveillance System (STSS) program in the Missile Defense Agency (MDA). How closely coordinated are these two programs?

Dr. SEGA. Although program management direction and funding for STSS comes directly from MDA, MDA routinely provides program updates to Air Force leadership (SMC and Air Force Space Command) and is planning to eventually transition the STSS Block 2012 program to the Air Force. Programmatically, both the SBIRS-High and STSS programs are physically colocated in the same building at the SMC, in Los Angeles, enabling close technical interaction and sharing of lessons learned between the two programs. In fact, the same System Program Director who reports to both MDA and Air Force leadership leads SBIRS-High and STSS.

General CHILTON. The SBIRS-Low program was transferred from the Air Force to the MDA in December 2002. MDA restructured SBIRS-Low into the STSS to meet Ballistic Missile Defense System (BMDS) requirements. STSS is fundamentally different from the old SBIRS-Low program. STSS will require cueing from SBIRS-High and other BMDS sensors to achieve its global midcourse tracking objectives. The SBIRS-High program and the STSS program are beginning the initial transition planning phase. MDA is coordinating the initial STSS transition plan with the Air Force. The transition planning should ensure close coordination between the two programs.

43. Senator BILL NELSON. Dr. Sega and General Chilton, the ground station designed and built to fly the two satellite systems is operational. Will the STSS still be flown from the recently completed ground station?

Dr. SEGA. The STSS Block 2006 satellites will be flown from the Missile Defense Space Experimentation Center (MDSEC) located at the Joint National Integration Center (JNIC) at Schriever Air Force Base. Since the Block 2006 satellites are R&D BMDS test bed assets, they will be flown from the MDSEC, which operates all of MDA's R&D space assets. MDA and Air Force Space Command (AFSPC) are currently developing and finalizing a transition plan for the STSS Block 2012 satellite constellation. The initial satellites in this constellation will likely also be flown out of the MDSEC but will transfer to an Air Force ground station of choice—to be determined at a future date. As part of this transition, MDA has made space available at the MDSEC for AFSPC operators to begin to learn to operate the STSS Block 2006 satellites so that a smooth transition of the STSS Block 2012 satellites can occur.

General CHILTON. The STSS Block 2006 satellites will be flown from the MDSEC located at the Joint National Integration Center at Schriever AFB, Colorado. The MDA and AFSPC are developing the initial transition plan for the STSS Block 2012 satellites. The transition plan will detail the STSS location upon completion.

OPERATIONALLY RESPONSIVE SPACE

44. Senator BILL NELSON. Dr. Sega, General Chilton, General Hamel, and Admiral Deutsch, the idea of ORS is that for some missions, or to augment some requirements, it might be possible to use small, commercial-like satellites that could be quickly launched with small launch vehicles. These satellites could be preassembled, or modular and assembled on demand, and launched within hours or days. Or they could be small commercial-like satellites for a focused short-term mission that could be designed, built, and launched within a year or two. While there are many options

to explore, the capability to quickly and cheaply build and launch the small satellites must be established. Some progress has been made but much remains to be done. Is TacSat-2 fully funded, both launch and satellite development?

Dr. SEGA. TacSat-2 satellite development and launch are fully funded. The launch vehicle for the planned November 2006 launch was funded in fiscal year 2006 budget.

General CHILTON. STRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

General HAMEL. The payload development for TacSat-2 and TacSat-3 is fully funded; however, there is a \$3.5 million shortfall in fiscal year 2006 for the development of the satellite bus. The Air Force has a below threshold reprogramming solution and is implementing that now. There is also an fiscal year 2007 \$9.0 million shortfall for TacSat launches that the Air Force will correct with an additional below-threshold reprogramming next fiscal year.

The funding for TacSat comes from several sources—Air Force Research Laboratories, National Reconnaissance Office, AFSPC, Naval Research Lab (NRL)/Office of Naval Research (ONR), as well as the Army. The Air Force recognizes that multiple stakeholders require increased attention to coordination and mission partnering efforts. In the fiscal year 2007 President's budget, with the formation of the ORS program element, the Air Force is attempting to consolidate funding for responsive payloads, spacelift, and launch/traffic control to address this challenge.

Admiral DEUTSCH. Air Force is responsible for TacSat-2 and Navy fully funded its portion of a secondary payload in accordance with the TacSat-2 Advanced Concept Technology Demonstration (ACTD) Memorandum of Agreement (MOA). Air Force Research Lab and the Space and Missile Center Detachment 12—Space Test Program also contributed funding for payload development and integration onto the satellite, per the ACTD MOA. Air Force is responsible for launch.

45. Senator BILL NELSON. Dr. Sega, General Chilton, General Hamel, and Admiral Deutsch, is TacSat-3 fully funded, both launch and satellite development?

Dr. SEGA. TacSat-3 payload development is fully funded. However, there is a \$2.5 million shortfall in the TacSat-3 bus development and the Air Force is reprogramming to resolve this shortfall. The launch acquisition will require an additional \$19.0 million in a fiscal year 2007 reprogramming adjustment to be handled within the Air Force.

General CHILTON. STRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective service responsible for the capability in question.

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Admiral DEUTSCH. Air Force has overall responsibility for TacSat-3 and Navy fully funded a secondary payload. Air Force is responsible for launch.

46. Senator BILL NELSON. Dr. Sega, General Chilton, General Hamel, and Admiral Deutsch, what is the funding plan for TacSat-4?

Dr. SEGA. The funding for the TacSat-4 launch vehicle is part of the AFSPC fiscal year 2008 budget proposal currently being evaluated at Headquarters Air Force. NRL is the lead for production of the TacSat-4 satellite. The ONR is funding spacecraft development and integration, AFSPC and SMC, Detachment 12 (Det 12) are

funding the launch vehicle, and the Office of the Secretary of Defense's Office of Force Transformation (OFT) is funding the modular bus.

General CHILTON. STRATCOM respectfully defers platform and system specific questions to those Service representatives who maintain programmed funding and execution responsibilities. Existing or planned capabilities and decisions specific to the manning, training, and equipping of forces as part of Service programmed capabilities in support of the combatant commanders should be directed to the respective Service responsible for the capability in question.

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Admiral DEUTSCH. TacSat-4 is a joint effort with Navy funding payload development and 1 year of operations, the OFT funding the standard satellite bus and Air Force funding launch. Navy fully funded TacSat-4 payload development at \$20 million over 2½ years beginning in fiscal year 2006 through the ONR's Space Innovative Naval Prototypes program. Navy is also funding \$2.8 million for ground station infrastructure and 1 year of satellite operations.

FUTURE SPACE INITIATIVES

47. Senator BILL NELSON. Dr. Segal, the Strategic Forces Subcommittee held a hearing on missile defense on Tuesday of this week. One of the topics that we discussed briefly was the future space program at the MDA. Of course, today MDA has the STSS program for warning and sensing, and N-fire for plume characterization, but the MDA is looking at other potential space programs beginning in 2008. Will those programs be coordinated with you?

Dr. SEGAL. Yes. The Director, MDA, the Assistant Secretary of the Air Force for Acquisition, and the Under Secretary of the Air Force have established an MDA-AF Board of Directors (BoD) to resolve acquisition and operational issues, which is being superseded by the MDA-Joint Service BoD. The BoD interacts during the development, transition, production, and deployment of Air Force air and space missile defense capabilities. In addition, an Air Force liaison team was formed, and made resident in MDA, to support bilateral coordination and communication.

48. Senator BILL NELSON. Dr. Segal, will they fall under your capacity as the DOD Executive Agent for Space?

Dr. SEGAL. Space efforts under MDA are the responsibility of the Director of MDA. Once these efforts transition to the military, the programs will fall under the DOD Executive Agent for Space.

49. Senator BILL NELSON. Dr. Segal, will the National Space Acquisition Policy apply to those programs?

Dr. SEGAL. As long as these efforts are under MDA management they do not fall under the National Security Space Acquisition Policy. Once these efforts are transitioned to a Service depending on the program, they will be consistent with the National Security Space Acquisition Policy.

50. Senator BILL NELSON. Dr. Segal, will they be consistent with current space policy that effects are reversible and temporary?

Dr. SEGAL. The current MDA programs are outside of my direct responsibilities as the DOD Executive Agent for Space and Under Secretary of the Air Force. Lieutenant General Obering can provide more details on these programs.

51. Senator BILL NELSON. Dr. Segal, specifically I am curious about the proposed space test bed at MDA. While there is no funding for the space test bed requested in fiscal year 2007, and MDA officials have said that no decision will be taken on whether to pursue the space test bed until 2008, the budget documents state that the space test bed is "an essential element of the BMDS acquisition plan." This would indicate that a decision has been made. As the DOD Executive Agent for Space can you explain the status of the test bed and your role in the decision?

Dr. SEGAL. The space test bed you are referring to is a MDA program and outside of my direct responsibilities as the DOD Executive Agent for Space. As a member of MDA's BoD, I do provide advice and counsel to Lieutenant General Obering on space systems and activities. I also review MDA's plans and programs to ensure that we are adequately leveraging MDA's R&D efforts as well as ensuring we are

adequately integrating future BMD operational systems into our capabilities. This involvement supports a consistent approach across all the national space systems.

52. Senator BILL NELSON. Dr. Sega, in addition, the MDA budget request for the micro satellite project lists three experiments, one of which is the target risk reduction experiment. The purpose of this experiment is described as a demonstration “of the ability of micro satellites to serve as cooperative targets for the ballistic missile defense system.” Given that a micro satellite’s characteristics are quite different from those of an Intercontinental Ballistic Missile, what is the purpose of the experiment?

Dr. SEGA. The program you are referring to is an MDA program and outside of my direct responsibilities as the DOD Executive Agent for Space. Lieutenant General Obering can provide more details on this program.

53. Senator BILL NELSON. Dr. Sega, wouldn’t hitting a micro satellite with an interceptor be the equivalent of an anti-satellite weapons test?

Dr. SEGA. The program you are referring to is a MDA program and outside of my direct responsibilities as the DOD Executive Agent for Space. Lieutenant General Obering can provide more details on this program.

54. Senator BILL NELSON. Dr. Sega, who is the milestone decision authority for this project?

Dr. SEGA. In accordance with DODD 5134.9, MDA, the milestone decision authority for the Micro Satellite Targets Systems—Risk Reduction project is the Director, MDA.

55. Senator BILL NELSON. Dr. Sega, what is your role in this program?

Dr. SEGA. As the DOD Executive Agent for Space, I coordinate with the MDA on space projects. My role is to examine how best to apply potential technology applications that are being studied.

56. Senator BILL NELSON. Dr. Sega, recent press reports indicate that the MDA is going to report to a BoD. Will you be part of this BoD? If not, how do you exercise your DOD Executive Agent for Space authority in conjunction with MDA?

Dr. SEGA. The Director of the MDA reports to the USD (AT&L). As a member of MDA’s BoD, I do provide advice and counsel to Lieutenant General Obering on space systems and activities. As with other MDA programs that relate to space, my job is to maintain a high level of awareness of those programs through staff involvement.

[Whereupon, at 5:23 p.m., the subcommittee adjourned.]

